Air Quality NSR Permit No. 122362/PSDTX-1430M1 Amendment

Moda Ingleside Energy Center

Ingleside, San Patricio County, Texas

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1.0 INTRODUCTION

Moda Ingleside, LLC (Moda) owns and operates the Moda Ingleside Energy Center (MIEC or "the terminal") located at 1450 Lexington Blvd in Ingleside, San Patricio County, Texas. San Patricio County is currently designated as attainment for all criteria pollutants and averaging times.[1] Moda has been assigned Texas Commission on Environmental Quality (TCEQ) Customer Number (CN) 605745140. The MIEC has been assigned TCEQ Regulated Entity Number (RN) 101225746.

The MIEC is a for-hire crude and condensate storage and marine loading terminal. Operations at the terminal are authorized by TCEQ New Source Review (NSR) Air Quality Permit No. 122362/PSDTX-1430M1, Permits by Rule (PBRs) Registration Nos. 117816, 159913, and 161880; Non-Rule Standard Permit (NRSP) for Pollution Control Project (PCP) Registration No. 162551, and Site Operating Permit (SOP) No. O-3906. The authorizations affected by the proposed project include NSR Air Quality Permit No. 122362/PSDTX-1430 and PBR Registration No. 159913, and NRSP for PCP Registration No. 162551. PBR 159913 and NRSP for PCP 162551 will be consolidated by incorporation. No other PBRs will be consolidated by reference or incorporation as part of this permit amendment.

With this NSR permit amendment application, Moda proposes the following:

- Revise oxides of nitrogen (NO_X) and carbon monoxide (CO) emission factors for the marine loading VCUs based on October 2020 stack testing results;
- Revise tank emission calculations based on as-built drawings;
- Revise naming of several emission point numbers (EPNs);
- Increase the hydrogen sulfide (H_2S) content in crude and condensate to 50 parts per million by weight (ppmw) in liquid for storage tanks and equipment leak fugitives to accommodate a broader variety of incoming crude oils;
- Update lower heating value (LHV) to higher heating value (HHV) for the combustion emission calculations;
- Increase operational flexibility, including storage tank throughputs and loading rates at the marine docks, to allow for tank-to-tank transfers and improved loading efficiency of larger vessels as the ship channel is deepened; and
- Consolidate by incorporation PBR 159913 and NRSP for PCP 162551.

In order to properly authorize emissions from the site, Moda respectfully submits this State NSR permit amendment application pursuant to 30 Texas Administrative Code (TAC) §116.116(b), Permit Amendments.

[1] Attainment data obtained from https://www.tceq.texas.gov/airquality/sip/cc/cc-status, accessed on December 19, 2020.

1.1 Permit Fee Information

A permit fee of $900 for this project is based on its status as a permit amendment application and in accordance with the fee schedule set forth by 30 TAC §116.141. There are no capital costs associated with the project as the facilities are currently authorized under PBR, NRSP for PCP, and/or constructed. Moda has submitted payment of $900 to the TCEQ Financial Administration Division via ePay.

1.2 Application Content

The remaining sections in this application are organized as follows:

+ Section 2.0 – Provides descriptions of the current operations and activities at the MIEC and the proposed project;
+ Section 3.0 – Provides discussion of Nonattainment NSR (NNSR) and Prevention of Significant Deterioration (PSD) Review;
+ Section 4.0 – Presents a review of general permit requirements;
+ Appendix A – Contains the TCEQ NSR workbook;
+ Appendix B – Contains the area map and plot plan;
+ Appendix C – Contains the process flow diagram;
+ Appendix D – Contains the current authorization documentation;
+ Appendix E – Contains detailed emission calculations; and
+ Appendix F – Contains detailed revised emission calculations for evaluating the PSD review applicability from the permit issued December 6, 2019.

2.0 PROJECT AND PROCESS DESCRIPTIONS

The MIEC is a crude, condensate, and bunker oil storage and marine loading terminal that receives materials via pipeline and marine modes, and stores materials in storage tanks prior to loading them into ships (including very large crude carriers [VLCCs]), ocean-going barges, and inland barges. Inbound materials are either loaded into storage tanks from the pipeline or unloaded into storage tanks from marine vessels at Dock 7. Outbound materials are loaded directly into marine vessels from either the pipeline or storage tanks at any of three docks (Dock 2, Dock 4, or Dock 5). The MIEC storage tanks consist of internal floating roof (IFR) and vertical fixed roof (VFR) storage tanks.

2.1 Project Description

Moda proposes the following with this NSR permit amendment application:

- Revise NO_X and CO emission factors for marine VCUs 1-3 and 5-7 based on stack testing results from October 2020;
- Incorporate as-built equipment specifications on storage tanks:
    - Update floating roof deck fitting component counts and controls;
    - Update the diameter on the 202,000 barrel (bbl) IFR tank (EPN: T-126) from 210 ft to 140 ft;
    - Update the number of columns on the 467,000 bbl and 202,000 bbl IFR tanks;
- Rename EPNs: EMERTK1 and EMERTK2 as RT-1 and RT-2, respectively;
- Increase the H_2S content in crude and condensate to 50 ppmw in liquid for storage tanks and equipment leak fugitives to accommodate a broader variety of incoming crude oils;
- Update LHV to HHV for the combustion emission calculations, which results in emission increases from routine and MSS combustion sources;
- Increase sitewide annual throughput and operational flexibility to reflect changing market conditions;
- Increase operational flexibility to reflect changing market conditions;
    - Increase storage tank throughputs to allow for tank-to-tank transfers as may be required to manage crude inventories during demand fluctuations and an increasing variety of incoming crudes;
    - Increase the short-term and annual marine loading rates to load larger vessels more efficiently, which shippers are shifting to as the ship channel is deepened. The ability to efficiently and more fully load large vessels may lead to a reduced number of vessels docked overall since fewer of the smaller lightering vessels will be required, and ultimately improve vessels' dockside idling emissions and vessel traffic;
- Consolidate by incorporation PBR Registration No. 159913. The following are updates to the bunker oil operations since the issuance of PBR Registration No. 159913:
    - The boilers included in this registration were not constructed and will not be

incorporated into NSR Permit No. 122362. Heat to the bunker oil tanks (EPNs: BT-201, BT-202, and BT-203) is instead provided by an existing hot oil heater (EPN: HOH-1);

- Bunker oil is unloaded at Dock 7 and loaded at Docks 2, 4, and 5. Because there is no marine loading at Dock 7, it is not an emissions unit and EPN: DOCK-7 will not be incorporated into NSR Permit No. 122362;
- Add low vapor pressure marine loading EPNs to Docks 2, 4, and 5 (EPNs: DOCK-2LO, DOCK-4LO, and DOCK-5LO, respectively);
- The short-term inland barge loading rate for bunker oil has been increased due to increased market demand since original project scoping;
- The tank degassing calculation has been updated to account for Best Available Control Technology (BACT) for degassing of fixed roof tanks and to better reflect expected atmospheric degassing operations;

+ Consolidate by incorporation NRSP for PCP Registration No. 162551 for marine VCU-8. The NO_X and CO emission factors from the October 2020 stack tests on marine VCUs 1-3 and 5-7 will be used to update the VCU-8 emission estimates; and
+ Corrections to formulas in previously submitted emission calculations, including updated uncontrolled venting from crude and condensate tanks during tank degassing events. The methodology has been updated to be consistent with the TCEQ's MSS Guidance.[2]

Some of the changes listed above are as-built corrections to sources included in the permit amendment issued on December 6, 2019 (the "2019 application"). Moda has evaluated the effect of the as-built changes on the 2019 application's public notice applicability to demonstrate that the as-built changes would not have triggered public notice. The following are the as-built corrections or otherwise general corrections to be considered:

1. Revised NO_X and CO emission factors from VCUs 1-3 and 5-7;
2. As-built updates to tank emission calculations;
3. Updated heating values on combustion calculations; and
4. Calculation formula corrections.

As a result of the changes listed, above, the project still did not exceed the emission thresholds that would require public notice. Pollutants continued to reflect an overall decrease in emissions or an increase of less than 5 tons per year. A summary of project increases is included in Table 3-1 in Section 3.2 of this application. Revised 2019 application emission calculations are included as Appendix F to this submittal.

Moda has also revised the PSD analysis from the 2019 application to reflect the above updates. This revised analysis demonstrates that PSD review also would not have been required by the as-built

[2] TCEQ MSS Guidance, Sep 2012.

corrections in this application. The PSD analysis is discussed in Section 3.2 of this document. Detailed PSD review applicability calculations are included in Table E-2 in Appendix E to this document.

2.2 Process Description

2.2.1 Storage Tanks and Tank Truck Loading

Crude and condensate are received via pipeline and may be stored in one of the site's IFR storage tanks (EPNs: T-101 through T-144, T-201, and T-202). Crude and condensate stored in the storage tanks has a maximum H_2S content of 50 ppmw. Bunker oil is received at Dock 7 and unloaded into one of the site's heated VFR storage tanks (EPNs: BT-201, BT-202, and BT-203). Heat is supplied to the bunker oil storage tanks by an existing natural gas-fired hot oil heater (EPN: HOH-1).

The site also has two relief tanks (EPNs: RT-1 and RT-2), which handle off-spec material transferred during the specification testing portion of the marine loading operations. Off-spec material is removed from the site via tank trucks. Tank truck loading is controlled by a permanent VCU (EPN: VCU-4). Uncaptured tank truck loading fugitives (EPN: TRUCKLOAD) consist of VOCs and H_2S.

2.2.2 Marine Loading

Crude and condensate (high vapor pressure [VP] materials) handled at the docks (EPNs: DOCK-2, DOCK-4, and DOCK-5) are loaded into ships, ocean-going barges, and inland barges. Crude and condensate loaded into marine vessels has a maximum H_2S content of 10 ppmw. Bunker oil (low VP material) handled at the docks (EPNs: DOCK-2LO, DOCK-4LO, and DOCK-5LO) is also loaded into ships, ocean-going barges, and inland barges. Materials are loaded into vessels from either the storage tanks (EPNs: T-101 through T-144, T-201, T-202, BT-201, BT-202, and BT-203) or directly out of the pipeline. Vapors from marine loading of high VP materials are collected by a vapor collection system. Uncollected marine loading vapors from ship and ocean-going barge loading of high VP materials are emitted to the atmosphere from fittings on the vessel decks (EPNs: DOCK-2, DOCK-4, and DOCK-5). Vapors from high VP material loading of inland barges are collected with 100% efficiency. Vapors from low VP material loading of all marine vessel types are uncollected and emitted to the atmosphere (EPNs: DOCK-2LO, DOCK-4LO, and DOCK-5LO). Fugitive emissions from marine loading consist of VOCs (from high and low VP materials) and H_2S (high VP materials only). Loading can occur at Docks 2, 4, and 5 simultaneously.

Collected vapors are controlled by seven (7) natural gas-fired VCUs (EPNs: VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, and VCU-8). Emissions from the combustion of marine loading vapors in the VCUs will consist of VOCs, H_2S, NO_X, CO, particulate matter (PM), and sulfur dioxide (SO_2).

There are piping and fugitive components (EPN: FUG) associated with the pipeline and loading operations that emit to the atmosphere through equipment leaks. Equipment leak fugitive emissions consist of VOCs and H_2S.

Figure C-1 in Appendix C presents a representative process flow diagram for routine operations from the proposed project.

2.2.3 Convenience Roof Landings and Maintenance, Startup, and Shutdown

The floating roofs are landed (i.e., the liquid level falls below the roof leg height and the roof is no longer floating on the liquid, creating a vapor space between the liquid and the roof) as convenience landings several times per tank, per year. Roof landing emissions result from standing idle and refilling losses. Moda controls roof landing emissions from tanks T-101 through T-108, T-110, and T-111 with a permanent VCU (EPN: VCU-4). Roof landing emissions from all other tanks are controlled with a propane-fired portable VCU (EPN: PORTVC).

No more than once per year per tank, the tanks may be degassed for cleaning and/or inspection. To degas a tank, all liquid is drained from the tank. For high VP materials, the tank vapors are routed to either a permanent VCU (EPN: VCU-4 for tanks T-101 through T-108, T-110, and T-111) or portable VCU (EPN: PORTVC for all other tanks not connected to VCU-4). The tank is ventilated, and vapors are routed to the control device (EPNs: VCU-4 and PORTVC). For the tanks which use the portable VCU (EPN: PORTVC), the device is located nearby the tank being degassed. When the vapor space VOC concentration in the tank is below 10,000 ppm by volume (ppmv), emissions can be vented directly to the atmosphere (EPN: MSS-ATM).[3] Because the maximum vapor space VOC concentration in low VP material tanks is always below 10,000 ppmv, the low VP material vapor space is not routed to control and is vented directly to the atmosphere. Degassing to the atmosphere continues until it is safe for personnel to enter the tank.

Tank roof landing, degassing, and uncontrolled venting emissions consist of VOCs and H_2S.

Figure C-2 in Appendix C presents a representative process flow diagram for MSS operations from the proposed project.

2.2.4 Miscellaneous MSS

As needed, piping and equipment such as pumps, filters, meters, and valves are drained, degassed, and refilled for MSS activities. Prior to draining piping, high VP material vapors are routed to control by a portable VCU (FIN: EQDEGAS, EPN: MSS-CONT). Pump and filter/meter/valve vapors are emitted directly to the atmosphere (FIN: EQDEGAS, EPN: MSS-ATM). Emissions from equipment draining (FIN: EQDRAIN, EPN: MSS-ATM) result from the pouring of liquids into buckets for transfer to frac tanks. Residual material from tanks, process equipment, piping, portable tanks, and portable containers is loaded into frac tanks for storage until it is removed from the site via vacuum truck. The high VP materials' frac tanks' standing and working emissions (FIN: FRACTKS, EPN: MSS-CONT), as well as vacuum truck loading (FIN: AIRVACMV, EPN: MSS-CONT), are controlled by the portable VCU. Emissions from high VP material equipment degassing and subsequent refilling are routed to the portable VCU (FIN: EQREFILL, EPN: MSS-CONT). Emissions from equipment after it has been degassed to 10,000 ppmv and prior to refilling are emitted to the atmosphere (EPN: MSS-ATM).

[3] BACT for storage tank maintenance, startup, and shutdown (MSS): https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/bact/bact-chemical.xlsx

3.0 FEDERAL NEW SOURCE REVIEW

The proposed project was reviewed to identify if the resulting emission increases exceed applicable thresholds for federal PSD and/or NNSR permitting requirements. As discussed below, the proposed emissions do not exceed thresholds for PSD or NNSR permitting requirements; therefore, Moda is applying for a minor (State) permit amendment.

3.1 NNSR Applicability Review

The proposed project is located in Ingleside, San Patricio County, Texas, which is currently designated attainment for all criteria pollutants; therefore, NNSR does not apply to the proposed project.

3.2 PSD Applicability Review

The MIEC is located in San Patricio County, Texas, which is designated attainment for all criteria pollutants; therefore, a PSD applicability review was performed for proposed emissions of VOC, NO_X, CO, SO_2, PM less than 10 microns in diameter (PM_{10}), PM less than 2.5 microns in diameter ($PM_{2.5}$), and H_2S.

The emission threshold for "major stationary sources" varies under PSD according to the source type. As defined by 40 CFR §52.21(b)(1)(i), a source is considered major under PSD if it emits or has the potential to emit 250 tons per year or more of any criteria pollutant, or 100 tons per year for specified source categories. The MIEC is one of the specified or "named" source categories and is an existing major source for purposes of PSD; therefore, the PSD major modification thresholds apply to the proposed project. The project increase in emissions of each pollutant were compared to the PSD major source threshold to determine PSD applicability. The following table documents the estimated project emissions (including fugitives) for each pollutant being reviewed for this proposed project.

In addition to the proposed project, there are changes submitted with this permit amendment application that affect sources included in the 2019 application. The effect of those changes on the 2019 application's sources was evaluated to demonstrate that even with those changes used in the 2019 application calculations, PSD review would still not have been triggered. The 2019 application's recalculated project increases are included in Table 3-1. Detailed 2019 application revised emission calculations are included as Appendix F to this application.

The proposed project emissions increases in Table 3-1 are each less than the major modification thresholds; therefore, PSD review does not apply to the proposed project or the revised 2019 application's project.

Table 3-1
Proposed Emissions (tpy)

	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	H_2S
2021 Project Increases [1]	0.57	38.94	6.32	20.20	1.93	1.93	0.95
2019 Recalculated Project Increases [2]	-24.93	-42.36	-153.22	3.56	1.16	1.16	-0.78
PSD Major Source Modification Threshold	40	40	100	40	15	10	10
Less Than PSD Major Source Modification Threshold?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

[1] 2021 Project Increases compared the current project to the potential to emit (PTE) values from the Maximum Allowable Emission Rate Table (MAERT) issued with the November 30, 2020 permit. Because the site is not yet completely built out and cannot operate at its maximum operating conditions, the PTE is used as the baseline emissions.

[2] 2019 Recalculated Project Increases compared the recalculated values for sources authorized in the MAERT issued on December 6, 2019 to the PTE values from the MAERT issued with the February 11, 2019 permit alteration. This comparison is consistent with the analysis from the permit application submitted for the permit issued on December 6, 2019.

4.0 GENERAL PERMIT REQUIREMENTS

The following sections address the requirements of the Texas Clean Air Act (TCAA) as codified in 30 TAC §116.111(a) along with Moda's plans for expected compliance.

4.1 Protection of Public Health and Welfare [30 TAC §116.111(a)(2)(A)]

As presented below, the emissions from the facilities will comply with the air quality rules and regulations and with the intent of the TCAA, including protection of the health and physical property of the people. No schools or other critical receptors were identified within 3,000 feet of the site boundary.

4.1.1 TCEQ General Rules [30 TAC CHAPTER 101]

4.1.1.1 Subchapter A [General Rules]

Moda will operate the facilities in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for major upsets, notification requirements for maintenance, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency (EPA) Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and other applicable General Rules.

4.1.1.2 Subchapter C [Voluntary Supplemental Leak Detection Program]

The MIEC is not participating in a voluntary supplemental leak detection program; therefore, the requirements of Subchapter C do not apply.

4.1.1.3 Subchapter F [Emissions Events and Scheduled Maintenance, Startup, and Shutdown Activities]

Moda will comply with the emissions events, scheduled MSS recordkeeping, and reporting requirements. The MIEC will maintain and operate equipment and control devices in a manner to minimize the excess emission events. Moda, as needed, will comply with the procedures for applying for, obtaining, and transferring a variance.

4.1.1.4 Subchapter H [Emissions Banking and Trading]

Moda will comply with the requirements of Division 4 related to the generation, certification, and use of Discrete Emission Reduction Credits (DERCs).

The MIEC is located in San Patricio County, which is an attainment county. Facilities in attainment counties may not generate Emission Reduction Credits (ERCs); therefore, the requirements of Division 1 do not apply.

The terminal is located in San Patricio County; therefore, the requirements of Division 3 (Mass Emission Cap and Trade Program) and Division 6 (Highly Reactive Volatile Organic Compound Emissions Cap and Trade Program) do not apply.

The terminal is not an electric generating facility; therefore, the requirements of Divisions 2 and 7 do not apply.

4.1.2 Visible Emissions and Particulate Matter [30 TAC CHAPTER 111]

4.1.2.1 Subchapter A [Visible Emissions and Particulate Matter]

The sources of emissions included in this permit amendment will not result in visible emissions in excess of those allowed under §111.111 of Division 1.

There are no solid waste incineration devices at the terminal as addressed in Division 2 sections §111.121 through §111.129.

Facility operations do not involve abrasive blasting of potable water storage tanks performed by portable operations as discussed in Division 3 sections §111.131 through §111.139.

The terminal is not located in any of the geographic areas subject to the requirements of Division 4 sections §111.141 through §111.149 do not apply.

The vapor combustors (EPNs: VCU-1 through VCU-8, and PORTVC) used for controlling marine loading vapors, roof landing emissions, and degassing emissions will comply with the emission limit and effective stack height requirements of Division 5 section §111.151. There are no steam generators at the site; therefore, the requirements of Division 5 section §111.153 do not apply.

There are no agricultural processes, as discussed in Division 6 sections §111.171 through §111.175, and no portable or transient operations as discussed in Division 7 sections §111.181 through §111.183 associated with the operations at the terminal.

No portable or transient operations as discussed in Division 7 sections §111.181 through §111.183 are associated with the operations at the terminal.

4.1.2.2 Subchapter B [Outdoor Burning]

Outdoor burning will not be conducted at the site; therefore sections §111.201 through §111.221 do not apply.

4.1.3 Sulfur Compounds [30 TAC CHAPTER 112]

4.1.3.1 Subchapter A [Control of Sulphur Dioxide]

Vapors from marine loading are routed to vapor combustors (EPNs: VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, and VCU-8). Emissions from tank roof landings and degassing are routed to a permanent VCU (EPN: VCU-4) or portable VCU (EPN: PORTVC). The hydrogen sulfide in the vapors is combusted and converted to sulfur dioxide. If requested to test compliance with the applicable requirements of this regulation, Moda will comply with the testing, reporting, and recordkeeping requirements of section §112.2. The site will comply with the net ground level concentrations specified in section §112.3.

Moda does not operate a sulfuric acid plant nor a sulfur recovery plant, does not fire solid fossil fuel, does not operate a nonferrous smelter process unit; therefore, requirements of sections §112.5 through §112.14 do not apply.

4.1.3.2 Subchapter B [Control of Hydrogen Sulfide]

Facilities in this project emit hydrogen sulfide; therefore, the requirements of Subchapter B apply. The site will comply with the applicable requirements of sections §112.31 through §112.34.

4.1.3.3 Subchapter C [Control of Sulfuric Acid]

The MIEC is not a source of sulfuric acid; therefore, the requirements of sections §112.41 through §112.47 do not apply.

4.1.3.4 Subchapter D [Control of Total Reduced Sulfur]

Moda does not operate a Kraft Pulp mill; therefore, the requirements of sections §112.51 through §112.59 do not apply.

4.1.4 Toxic Materials [30 TAC CHAPTER 113]

4.1.4.1 Subchapter B [National Emission Standards for Hazardous Air Pollutants (FCAA, §112, 40 CFR Part 61)]

The MIEC does not operate a phosphogypsum stack; therefore, Division 1 does not apply.

4.1.4.2 Subchapter C [National Emission Standards for Hazardous Air Pollutants for Source Categories (FCAA, §112, 40 CFR Part 63)]

The emission units associated with this project are subject to and will continue to comply with the requirements of 40 CFR Part 63, Subpart Y (National Emission Standards for Marine Tank Vessel Loading Operations) and 40 CFR Part 63, Subpart EEEE (National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution [Non-Gasoline]) as incorporated by reference into this subchapter.

4.1.4.3 Subchapter D [Designated Facilities and Pollutants]

The MIEC does not have a municipal solid waste landfill, hospital/medical/infectious waste incinerator, small municipal waste combustion unit, industrial solid waste incineration unit, or any other solid waste incineration unit at the site; therefore, Divisions 1 through 5 do not apply.

4.1.4.4 Subchapter E [Consolidated Federal Air Rules (CAR): Synthetic Organic Chemical Manufacturing Industry (SOCMI) {FCAA, §112, 40 CFR Part 65}]

The terminal is not engaged in the manufacture of synthetic organic chemicals; therefore, the requirements of sections §113.3000 through §113.3060 do not apply.

4.1.5 Volatile Organic Compounds [30 TAC CHAPTER 115]

4.1.5.1 Subchapter B [General Volatile Organic Compound Sources]

Storage tanks at the MIEC will continue to meet the applicable requirements of Division 1 (Storage of Volatile Organic Compounds), §115.112 through §115.119.

Divisions 2 through 6 do not apply to the terminal operations. Division 2 (Vent Gas Control), §115.120 through §115.129, is not applicable because there are no affected process vents at the terminal. VOC water separation will not be performed at the terminal; therefore, the requirements of Division 3 (Water Separation), §115.131 through §115.139, do not apply. The primary standard industrial classification (SIC) code of the terminal is 4226; therefore, Division 4 (Industrial Wastewater), §115.140 through §115.149, and Division 6 (Batch Processes), §115.160 through §115.169, do not apply. The terminal does not operate a municipal solid waste landfill; therefore, Division 5 (Municipal Solid Waste Landfills), §115.152 through §115.159, does not apply.

4.1.5.2 Subchapter C [Volatile Organic Compound Transfer Operations]

Although the site is located in San Patricio County, the MIEC is not subject to the requirements of Division 1 (Loading and Unloading of VOCs), §115.212 through §115.219 because the truck loading operations do not transfer gasoline (see 30 TAC §115.217(b)(1)). The MIEC is not subject to the requirements of Division 3 (Control of Volatile Organic Compound Leaks from Transport Vessels), §115.234 through §115.239, because the terminal is not located in one of the counties to which the division applies.

In addition, the following are not applicable to the terminal operations: Division 2 (Filling of Gasoline Storage Vessels [Stage I] for Motor Vehicle Fuel Dispensing Facilities), §115.221 through §115.229; Division 4 (Control of Vehicle Refueling Emissions [Stage II] at Motor Vehicle Fuel Dispensing Facilities), §115.240 through §115.249; and Division 5 (Control of Reid Vapor Pressure of Gasoline), §115.252 through §115.259. The MIEC is located in San Patricio County, which is not a regulated county under these Divisions.

4.1.5.3 Subchapter D [Petroleum Refining, Natural Gas Processing, and Petrochemical Processes]

None of the operations authorized by this permit are subject to the requirements of Subchapter D.

4.1.5.4 Subchapter E [Solvent-Using Processes]

None of the operations authorized by this permit are subject to the requirements of Subchapter E.

4.1.5.5 Subchapter F [Miscellaneous Industrial Sources]

The terminal is not located in one of the counties that is subject to the requirements of Subchapter F.

4.1.5.6 Subchapter G [Consumer-Related Sources]

Moda is not involved in the offering for sale, sale, supply, distribution, or manufacture of automotive windshield washer fluid for use in the State of Texas; therefore, the requirements of Subchapter G do not apply.

4.1.5.7 Subchapter H [Highly-Reactive Volatile Organic Compounds]

The MIEC is not located in the Houston-Galveston-Brazoria area and is therefore not subject to the requirements of Subchapter H.

4.1.5.8 Subchapter J [Administrative Provisions]

Moda will comply with the requirements of Subchapter J as applicable.

4.1.6 Nitrogen Compounds [30 TAC CHAPTER 117]

4.1.6.1 Subchapter B [Combustion Control at Major Industrial, Commercial, and Institutional Sources in Ozone Nonattainment Areas]

The MIEC is located in San Patricio County, which is not regulated by this Division; therefore, the requirements of Division 1 do not apply.

4.1.6.2 Subchapter C [Combustion Control at Major Utility Electric Generation Sources in Ozone Nonattainment Areas]

The MIEC is not considered a major utility electric generation source; therefore, the requirements of Divisions 1 through 4 do not apply.

4.1.6.3 Subchapter D [Combustion Control at Minor Sources in Ozone Nonattainment Areas]

The requirements of Subchapter D apply to sources located in the Houston-Galveston-Brazoria and Dallas-Fort Worth 8-hour ozone nonattainment areas. These requirements do not apply to the MIEC, which is located in San Patricio County.

4.1.6.4 Subchapter E [Multi-Region Combustion Control]

The terminal is not considered a utility electric generating source; therefore, the requirements of Division 1 do not apply. The site does not operate a portland cement kiln; therefore, the requirements of Division 2 do not apply. Moda is not a manufacturer, distributor, retailer, or installer of natural gas-fired water heaters, boilers, and process heaters; therefore, the requirements of Division 3 do not apply. The MIEC is not located in a county subject to the requirements of Division 4.

4.1.6.5 Subchapter F [Acid Manufacturing]

The MIEC does not operate an adipic acid or nitric acid manufacturing unit; therefore, the requirements of Divisions 1 through 3 do not apply.

4.1.6.6 Subchapter G [General Monitoring and Testing Requirements]

The compliance stack testing and emissions monitoring requirements of Subchapter G do not apply to the facilities at the terminal because the site is not subject to any emission specifications or operating requirements of Chapter 117, as discussed above.

4.1.6.7 Subchapter H [Administrative Provisions]

The provisions of Subchapter H do not apply to crude oil terminals in San Patricio County; therefore, Subchapter H does not apply to the MIEC.

4.1.7 Air Pollution Episodes [30 TAC CHAPTER 118]

Moda will operate the facilities in compliance with the rules relating to generalized and localized air pollution episodes.

4.1.8 Federal Operating Permits [30 TAC CHAPTER 122]

The terminal is subject to the federal operating permit program requirements of 30 TAC §122. Site Operating Permit No. O-3906 has been issued for this site.

4.2 Measurement of Significant Air Contaminants [30 TAC §116.111(a)(2)(B)]

The MIEC will have provisions for measuring the emission of significant air contaminants as determined by the executive director.

4.3 Best Available Control Technology [30 TAC §116.111(a)(2)(C)]

Moda will operate the applicable BACT for the emission sources as represented in the NSR workbook submitted as part of this permit amendment application.

4.4 New Source Performance Standards (NSPS) [30 TAC §116.111(a)(2)(D)]

Storage tanks at the MIEC will continue to comply with the applicable requirements of 40 CFR Part 60 Subpart Kb, for storage tanks constructed, reconstructed or modified after July 23, 1984.

4.5 National Emission Standards for Hazardous Air Pollutants (NESHAP) [30 TAC §116.111(a)(2)(E)]

The requirements of 40 CFR Part 61 do not apply to the facilities in this permit amendment application.

4.6 NESHAP for Source Categories [30 TAC §116.111(a)(2)(F)]

The facilities in this permit amendment application will continue to comply with the applicable requirements of 40 CFR Part 63, Subpart Y (National Emission Standards for Marine Tank Vessel Loading Operations) and 40 CFR Part 63, Subpart EEEE (National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution [Non-Gasoline]).

4.7 Performance Demonstration [30 TAC §116.111(a)(2)(G)]

The facilities will perform as represented in this permit amendment application. Upon request of the Executive Director of the TCEQ, additional engineering data, dispersion modeling, monitoring or stack testing data will be provided for the emission sources in this application.

4.8 Nonattainment Review [30 TAC §116.111(a)(2)(H)]

Refer to Section 3.1 of this permit amendment application for a discussion of Nonattainment Review.

4.9 Prevention of Significant Deterioration (PSD) Review [30 TAC §116.111(a)(2)(I)]

Refer to Section 3.2 of this permit amendment application for a discussion of PSD Review.

4.10 Air Dispersion Modeling [30 TAC §116.111(a)(2)(J)]

The Electronic Modeling Evaluation Workbook (EMEW) for this project, which includes model options, source parameters, and operating scenarios is submitted with this application. Air dispersion modeling results will be provided to the TCEQ with this submittal.

4.11 Hazardous Air Pollutants [30 TAC §116.111(a)(2)(K)]

The operations at the terminal are not considered an affected source as defined in Section 116.15(1) (relating to FCAA section §112(g) Definitions); therefore, the requirements of 30 TAC §116 Subchapter C do not apply.

4.12 Mass Cap and Trade Allowances [30 TAC §116.111(a)(2)(L)]

The MIEC is not subject to the requirements of 30 TAC §101 Subchapter H, Division 3 (Mass Emission Cap and Trade Program), as the program applies only to facilities located in the Houston-Galveston-Brazoria ozone nonattainment area.

4.13 Public Notice Requirements [30 TAC §116.111(b)]

Moda will comply with the applicable requirements specified in 30 TAC Chapter 39 and Chapter 55 relating to public notice and case hearings, as necessary.

Appendix A

TCEQ NSR WORKBOOK

I. Applicant Information	
I acknowledge that I am submitting an authorized TCEQ application workbook and any necessary attachments. Except for inputting the requested data and adjusting row height and column width, I have not changed the TCEQ application workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree
A. Company Information	
Company or Legal Name:	Moda Ingleside, LLC
Permits are issued to either the facility owner or operator, commonly referred to as the applicant or permit holder. List the legal name of the company, corporation, partnership, or person who is applying for the permit. We will verify the legal name with the Texas Secretary of State at (512) 463-5555 or at the link below:	
https://www.sos.state.tx.us	
Texas Secretary of State Charter/Registration Number (if given):	801849184
B. Company Official Contact Information: must not be a consultant	
Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Clayton
Last Name:	Curtis
Title:	VP Regulatory Affairs
Mailing Address:	1000 Louisiana, Ste. 7100
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77002
Telephone Number:	832-930-4473
Fax Number:	
Email Address:	clayton.curtis@modamidstream.com
C. Technical Contact Information: This person must have the authority to make binding agreements and representations on behalf of the applicant and may be a consultant. **Additional technical contact(s) can be provided in a cover letter.**	
Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Clayton
Last Name:	Curtis
Title:	VP Regulatory Affairs
Company or Legal Name:	Moda Midstream, LLC
Mailing Address:	1000 Louisiana, Ste. 7100
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77002
Telephone Number:	832-930-4473
Fax Number:	
Email Address:	clayton.curtis@modamidstream.com

D. Assigned Numbers

The CN and RN below are assigned when a Core Data Form is initially submitted to the Central Registry. The RN is also assigned if the agency has conducted an investigation or if the agency has issued an enforcement action. If these numbers have not yet been assigned, leave these questions blank and include a Core Data Form with your application submittal. See Section VI.B. below for additional information.

Enter the CN. The CN is a unique number given to each business, governmental body, association, individual, or other entity that owns, operates, is responsible for, or is affiliated with a regulated entity.	605745140
Enter the RN. The RN is a unique agency assigned number given to each person, organization, place, or thing that is of environmental interest to us and where regulated activities will occur. The RN replaces existing air account numbers. The RN for portable units is assigned to the unit itself, and that same RN should be used when applying for authorization at a different location.	101225746

II. Delinquent Fees and Penalties

Does the applicant have unpaid delinquent fees and/or penalties owed to the TCEQ? This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at the link below:	No

https://www.tceq.texas.gov/agency/financial/fees/delin

III. Permit Information

A. Permit and Action Type **(multiple may be selected, leave no blanks)**

Additional information regarding the different NSR authorizations can be found at the link below:
https://www.tceq.texas.gov/permitting/air/guidance/authorize.html

Select from the drop-down the type of action being requested for each permit type. **If that permit type does not apply, you MUST select "Not applicable".**

Provide all assigned permit numbers relevant for the project. Leave blank if the permit number has not yet been assigned.

Permit Type	Action Type Requested (do not leave blank)	Permit Number (if assigned)
Minor NSR (can be a Title V major source): *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Relocation/Alteration, Change of Location, Alteration, Extension to Start of Construction*	Amendment	122362/PSDTX1430M1
Special Permit: *Not applicable, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
De Minimis: *Not applicable, Initial*	Not applicable	
Flexible: *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
PSD: *Not applicable, Initial, Major Modification*	Not applicable	
Nonattainment: *Not applicable, Initial, Major Modification*	Not applicable	

HAP Major Source [FCAA § 112(g)]: *Not applicable, Initial, Major Modification*	Not applicable	
PAL: *Not applicable, Initial, Amendment, Renewal, Renewal/Amendment, Alteration*	Not applicable	
GHG PSD: *Not applicable, Initial, Major Modification, Voluntary Update*	Not applicable	

B. MSS Activities

How are/will MSS activities for sources associated with this project be authorized?	This permit

C. Consolidating NSR Permits

Will this permit be consolidated into another NSR permit with this action?	No
Will NSR permits be consolidated into this permit with this action?	No

D. Incorporation of Standard Permits, Standard Exemptions, and/or Permits By Rule (PBR)

To ensure protectiveness, previously issued authorizations (standard permits, standard exemptions, or PBRs) including those for MSS, are incorporated into a permit either by consolidation or by reference.

- -Authorizations entirely incorporated by consolidation will be voided when the project is complete, and the sources and allowable emissions will be added to the NSR permit's MAERT.
- -Authorizations incorporated by reference will be referenced with the final action for this project but will not be voided. Sources will continue to be authorized in the current manner.

At the time of renewal and/or amendment, consolidation (in some cases) may be voluntary and referencing is mandatory. More guidance regarding incorporation can be found in 30 TAC § 116.116(d)(2), 30 TAC § 116.615(3) and in this memo (link below):

https://www.tceq.texas.gov/assets/public/permitting/air/memos/pbr_spc06.pdf

Are there any standard permits, standard exemptions, or PBRs to be incorporated by reference?	No
Are there any PBR, standard exemptions, or standard permits associated to be incorporated by consolidation? **Note:** Emission calculations, a BACT analysis, and an impacts analysis must be attached to this application at the time of submittal for any authorization to be incorporated by consolidation.	Yes
If yes, list any PBR, standard exemptions, or standard permits that need to be consolidated:	159913, 162551
If yes, are emission calculations, BACT analysis, an impacts analysis, and a table of FINs and EPNs with authorization identifiers (registration number or rule citation) included for each authorization to be consolidated? **If any required information is not provided, the authorization will be incorporated by reference.**	Yes

E. Associated Federal Operating Permits

Is this facility located at a site required to obtain a **site operating permit (SOP)** or **general operating permit (GOP)?**	Yes
Is a **SOP** or **GOP** review pending for this source, area, or site?	No
If required to obtain a **SOP** or **GOP**, list all associated permit number(s). If no associated permit number has been assigned yet, enter "TBD":	O-3906

IV. Facility Location and General Information		
A. Location		
County: Enter the county where the facility is physically located.	San Patricio	
TCEQ Region	Region 14	
County attainment status as of Sept. 23, 2019	attainment or unclassified for all pollutants	
Street Address:	1450 Lexington Blvd	
City: If the address is not located in a city, then enter the city or town closest to the facility, even if it is not in the same county as the facility.	Ingleside	
ZIP Code: Include the ZIP Code of the physical facility site, not the ZIP Code of the applicant's mailing address.	78362	
Site Location Description: If there is no street address, provide written driving directions to the site. Identify the location by distance and direction from well-known landmarks such as major highway intersections.		
Use USGS maps, county maps prepared by the Texas Department of Transportation, or an online software application such as Google Earth to find the latitude and longitude.		
Latitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Latitude is the angular distance of a location north of the equator and will always be between 25 and 37 degrees north (N) in Texas.	027:49:32	
Longitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Longitude is the angular distance of a location west of the prime meridian and will always be between 93 and 107 degrees west (W) in Texas.	097:12:20	
Is this a project for a lead smelter, concrete crushing facility, and/or a hazardous waste management facility?		No
B. General Information		
Site Name:	Moda Ingleside Energy Center	
Area Name: Must indicate the general type of operation, process, equipment or facility. Include numerical designations, if appropriate. Examples are Sulfuric Acid Plant and No. 5 Steam Boiler. Vague names such as Chemical Plant are not acceptable.	Crude, condensate, and bunker oil storage and marine loading terminal	
Are there any schools located within 3,000 feet of the site boundary?	No	
C. Portable Facility		
Permanent or portable facility?	Permanent	

D. Industry Type	
Principal Company Product/Business:	Crude, condensate, and bunker oil storage and marine loading
A list of SIC codes can be found at the link below: https://www.naics.com/sic-codes-industry-drilldown/	
Principal SIC code:	4226
NAICS codes and conversions between NAICS and SIC Codes are available at the link below: https://www.census.gov/eos/www/naics/	
Principal NAICS code:	493190
E. State Senator and Representative for this site	
This information can be found at the link below (note, the website is not compatible to Internet Explorer): https://wrm.capitol.texas.gov/	
State Senator:	Judith Zaffirini
District:	21
State Representative:	J.M. Lozano
District:	43

V. Project Information	
A. Description	
Provide a **brief** description of the project that is requested (describe the what, not the how and why). Limited to 500 characters.	1. Revise NOx and CO emission factors for marine VCUs; 2. Revise tank emissions based on as-built drawings; 3. Revise EPN names; 4. Increase tank and fugitive H2S to 50 ppmw; 5. Increase annual throughputs; 6. Update LHV to HHV in combustion emission calcs; and 7. Incorporate PBR 159913 and NRSP for PCP 162551.
B. Project Timing	
Authorization must be obtained for many projects before beginning construction. Construction is broadly interpreted as anything other than site clearance or site preparation. Enter the date as "Month Date, Year" (e.g. July 4, 1776).	
Projected Start of Construction:	N/A
Projected Start of Operation:	N/A
C. Enforcement Projects	
Is this application in response to, or related to, an agency investigation, notice of violation, or enforcement action?	No
D. Operating Schedule	
Will sources in this project be authorized to operate 8760 hours per year?	Yes

VI. Application Materials	
All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. (30 TAC § 116.116)	
A. Confidential Application Materials	
Is confidential information submitted with this application?	No
B. Is the Core Data Form (Form 10400) attached (link to the form below)?	N/A
C. Is a current area map attached?	Yes
Is the area map a current map with a true north arrow, an accurate graduated scale, the entire plant property, the location of the property relative to prominent geographical features including, but not limited to, highways, roads, streams, and significant landmarks such as buildings, residences, schools, parks, hospitals, day care centers, and churches?	Yes
Does the map show a 3,000-foot radius from the property boundary?	Yes
D. Is a plot plan attached?	Yes
Does your plot plan clearly show a north arrow, an accurate scale, all property lines, all emission points, buildings, tanks, process vessels, other process equipment, and two bench mark locations?	Yes
Does your plot plan identify all emission points on the affected property, including all emission points authorized by other air authorizations, construction permits, PBRs, special permits, and standard permits?	Yes
Did you include a table of emission points indicating the authorization type and authorization identifier, such as a permit number, registration number, or rule citation under which each emission point is currently authorized?	Yes
E. Is a process flow diagram attached?	Yes
Is the process flow diagram sufficiently descriptive so the permit reviewer can determine the raw materials to be used in the process; all major processing steps and major equipment items; individual emission points associated with each process step; the location and identification of all emission abatement devices; and the location and identification of all waste streams (including wastewater streams that may have associated air emissions)?	Yes
F. Is a process description attached?	Yes
Does the process description emphasize where the emissions are generated, why the emissions must be generated, what air pollution controls are used (including process design features that minimize emissions), and where the emissions enter the atmosphere?	Yes
Does the process description also explain how the facility or facilities will be operating when the maximum possible emissions are produced?	Yes
G. Is a detailed list of requested actions included in the application? This list can be included in the project description.	Yes
H. Are detailed calculations attached? Calculations must be provided for each source with new or changing emission rates. For example, a new source, changing emission factors, decreasing emissions, consolidated sources, etc. Calculations do not need to be submitted for sources without any proposed emission rate changes. Note: the preferred format is an electronic workbook (such as Excel) with all formulas viewable for review.	Yes
Are emission rates and associated calculations for planned MSS facilities and related activities attached?	Yes

I. Is a material balance (Table 2, Form 10155) attached?	N/A
J. Is a list of MSS activities attached?	Yes
Are the MSS activities listed and discussed separately, each complete with the authorization mechanism or emission rates, frequency, duration, and supporting information if authorized by this permit?	Yes
K. Is a discussion of state regulatory requirements attached, addressing 30 TAC Chapters 101, 111, 112, 113, 115, and 117?	Yes
For all applicable chapters, does the discussion include how the facility will comply with the requirements of the chapter?	Yes
For all not applicable chapters, does the discussion include why the chapter is not applicable?	Yes
L. Are all other required tables, calculations, and descriptions attached?	Yes

VII. Signature

The owner or operator of the facility must apply for authority to construct. The appropriate company official (owner, plant manager, president, vice president, or environmental director) must sign all copies of the application. The applicant's consultant cannot sign the application. **Important Note: Unless submitting through STEERS, signatures must be original in ink, not reproduced by photocopy, fax, or other means, and must be received before any permit is issued.**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382; the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name:	Clayton Curtis (Signed in STEERS)
Signature:	
Original signature is required unless submitted through STEERS.	
Date:	January 22, 2021

I. Additional Questions for Specific NSR Minor Permit Actions

E. Concrete Batch Plants

Is this a project for a concrete batch plant?	No

VIII. Federal Regulatory Questions

Indicate if any of the following requirements apply to the proposed facility. Note that some federal regulations apply to minor sources. Enter all applicable Subparts.

A. Title 40 CFR Part 60

Do NSPS subpart(s) apply to a facility in this application?	Yes
List applicable subparts you will demonstrate compliance with (e.g. Subpart M)	Subpart Kb

B. Title 40 CFR Part 61

Do NESHAP subpart(s) apply to a facility in this application?	No

C. Title 40 CFR Part 63

Do MACT subpart(s) apply to a facility in this application?	Yes
List applicable subparts you will demonstrate compliance with (e.g. Subpart VVVV)	Subparts Y and EEEE

IX. Emissions Review

A. Impacts Analysis

Any change that may result in an increase in off-property concentrations of air contaminants requires an air quality impacts demonstration, which may include a qualitative analysis, the MERA, and/or modeling. Information regarding the air quality impacts demonstration must be provided with the application and show compliance with all state and federal requirements. Detailed requirements for the information necessary to make the demonstration are listed on the Impacts sheet.

Are there any increases in short-term and/or long-term allowable emission rates?	Yes
Can all the emission rate increases be attributed to speciation of currently authorized PM emissions and/or revisions of AP-42 or TCEQ guidance?	No
Are there any new or modified control devices or emission sources?	Yes
Are there any changes to emission point discharge parameters? Consider all parameters on the Stack Parameters sheet, including location.	No
Will any PBR registrations, standard permit, or standard exemptions be incorporated by consolidation?	Yes
Does this project require an impacts analysis?	Yes
Will off property impacts for any of the pollutants require Tier III Toxicology Effects Evaluation as defined in Appendix D of MERA?	Yes
Describe the land use and zoning authority for the area surrounding the site. (Limited to 500 characters.)	Property to the west and southwest of the site is residential. To the south, the site is bordered by Corpus Christi Bay. The property to the east of the site is industrial (Flint Hills and Buckeye terminals). Property to the north of the site is undeveloped.

B. Disaster Review

If the proposed facility will handle sufficient quantities of certain chemicals which, if released accidentally, would cause off-property impacts that could be immediately dangerous to life and health, a disaster review analysis may be required as part of the application. Contact the appropriate NSR permitting section for assistance at (512) 239-1250. Additional Guidance can be found at the link below:

https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/disrev-factsheet.pdf

Does this application involve any air contaminants for which a disaster review is required?	No

C. Air Pollutant Watch List

Certain areas of the state have concentrations of specific pollutants that are of concern. The TCEQ has designated these portions of the state as watch list areas. Location of a facility in a watch list area could result in additional restrictions on emissions of the affected air pollutant(s) or additional permit requirements. The location of the areas and pollutants of interest can be found at the link below:

https://www.tceq.texas.gov/toxicology/apwl/apwl.html

Is the proposed facility located in a watch list area?	No

D. Mass Emissions Cap and Trade

Is this facility located at a site within the Houston/Galveston nonattainment area (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties)?	No

X. Additional Requirements

A. Bulk Fuel Terminals

Is this project for a bulk fuel terminal?	No

B. Plant Fuel Gas Facilities

Does this site utilize plant fuel gas?	No

Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates

Permit primary industry (must be selected for workbook to function)	Chemical / Energy

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
Not New/Modified	No	DOCK-2	DOCK-2	Loading Dock No. 2 - Loading Fugitives	VOC	11.87				11.87		0	0	Loading: Marine Vessel	
					H2S	0.01				0.01		0	0		
Not New/Modified	No	DOCK-4	DOCK-4	Loading Dock No. 4 - Loading Fugitives	VOC	11.87				11.87		0	0	Loading: Marine Vessel	
					H2S	0.01				0.01		0	0		
Not New/Modified	No	DOCK-5	DOCK-5	Loading Dock No. 5 - Loading Fugitives	VOC	11.87				11.87		0	0	Loading: Marine Vessel	
					H2S	0.01				0.01		0	0		
New/Modified	No	DOCK-2LO	DOCK-2LO	Loading Dock No. 2 - Low VP Loading	VOC					17.01		17.01	0	Loading: Marine Vessel	
New/Modified	No	DOCK-4LO	DOCK-4LO	Loading Dock No. 4 - Low VP Loading	VOC					17.01		17.01	0	Loading: Marine Vessel	
New/Modified	No	DOCK-5LO	DOCK-5LO	Loading Dock No. 5 - Low VP Loading	VOC					17.01		17.01	0	Loading: Marine Vessel	
New/Modified	Yes	DOCK CAP	DOCK CAP	Dock Emissions Cap	VOC		35.54				49.34	0	13.8		
					H2S		0.04				0.05	0	0.01		
New/Modified	No	VCU-1	VCU-1	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		
New/Modified	No	VCU-2	VCU-2	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		
New/Modified	No	VCU-3	VCU-3	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		
New/Modified	No	VCU-5	VCU-5	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		
New/Modified	No	VCU-6	VCU-6	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		

Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
New/Modified	No	VCU-7	VCU-7	Collected and Controlled Marine Loading	VOC	10.78				5.06		-5.72	0	Control: Vapor Combustor	
					NOx	0.92				8.12		7.2	0		
					CO	0.39				2.05		1.66	0		
					PM	0.57				0.61		0.04	0		
					PM10	0.57				0.61		0.04	0		
					PM2.5	0.57				0.61		0.04	0		
					SO2	7.93				7.93		0	0		
					H2S	<0.01				<0.01		0	0		
Consolidate	No	VCU-8	VCU-8	Collected and Controlled Marine Loading	VOC			5.06	11.26	5.06		0	-11.26	Control: Vapor Combustor	
					NOx			0.92	2.63	8.12		7.2	-2.63		
					CO			0.39	1.13	2.05		1.66	-1.13		
					PM			0.57	1.58	0.61		0.04	-1.58		
					PM10			0.57	1.58	0.61		0.04	-1.58		
					PM2.5			0.57	1.58	0.61		0.04	-1.58		
					SO2			7.93	21.72	7.93		0	-21.72		
					H2S			<0.01	0.01	<0.01		0	-0.01		
New/Modified	Yes	VCUCAP	VCUCAP	Collected and Controlled Marine Loading Annual Cap	VOC		36.53				47.29	0	10.76		
					NOx		9.06				48	0	38.94		
					CO		4.16				10.48	0	6.32		
					PM		5.12				7.05	0	1.93		
					PM10		5.12				7.05	0	1.93		
					PM2.5		5.12				7.05	0	1.93		
					SO2		63.25				83.45	0	20.2		
					H2S		0.03				0.04	0	0.01		
New/Modified	No	T-101	T-101	Tank T-101	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-102	T-102	Tank T-102	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-103	T-103	Tank T-103	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-104	T-104	Tank T-104	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-105	T-105	Tank T-105	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-106	T-106	Tank T-106	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-107	T-107	Tank T-107	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-108	T-108	Tank T-108	VOC	9.94	5.52			9.68	5.56	-0.26	0.04	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.03	0.04	0.02		
New/Modified	No	T-109	T-109	Tank T-109	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-110	T-110	Tank T-110	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-111	T-111	Tank T-111	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-112	T-112	Tank T-112	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-113	T-113	Tank T-113	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-114	T-114	Tank T-114	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-115	T-115	Tank T-115	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-116	T-116	Tank T-116	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-117	T-117	Tank T-117	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
New/Modified	No	T-118	T-118	Tank T-118	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-119	T-119	Tank T-119	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-120	T-120	Tank T-120	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-121	T-121	Tank T-121	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-122	T-122	Tank T-122	VOC	9.91	6.02			9.66	3.87	-0.25	-2.15	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.02	0.04	0.01		
New/Modified	No	T-123	T-123	Tank T-123	VOC	9.91	6.02			9.66	3.87	-0.25	-2.15	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.05	0.02	0.04	0.01		
New/Modified	No	T-124	T-124	Tank T-124	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-125	T-125	Tank T-125	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-126	T-126	Tank T-126	VOC	8.86	4			12.45	2.62	3.59	-1.38	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.07	0.01	0.06	0		
New/Modified	No	T-127	T-127	Tank T-127	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-128	T-128	Tank T-128	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-129	T-129	Tank T-129	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-130	T-130	Tank T-130	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-131	T-131	Tank T-131	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-132	T-132	Tank T-132	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-133	T-133	Tank T-133	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-134	T-134	Tank T-134	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-135	T-135	Tank T-135	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-136	T-136	Tank T-136	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-137	T-137	Tank T-137	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-138	T-138	Tank T-138	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-139	T-139	Tank T-139	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-140	T-140	Tank T-140	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-141	T-141	Tank T-141	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-142	T-142	Tank T-142	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-143	T-143	Tank T-143	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		
New/Modified	No	T-144	T-144	Tank T-144	VOC	9.11	6.54			8.28	3.66	-0.83	-2.88	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.04	0.02	0.03	0.01		

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
New/Modified	No	T-201	T-201	Tank T-201	VOC	2.03	0.52			2.03	0.54	0	0.02	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	<0.01	<0.01			0.01	<0.01	0	0		
New/Modified	No	T-202	T-202	Tank T-202	VOC	2.03	0.52			2.03	0.54	0	0.02	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	<0.01	<0.01			0.01	<0.01	0	0		
New/Modified	No	RT-1	RT-1	Emergency Relief Tank 1	VOC	11.36	0.36			11.34	0.31	-0.0199	-0.05	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.06	<0.01	0.05	0		
New/Modified	No	RT-2	RT-2	Emergency Relief Tank 2	VOC	11.36	0.36			11.34	0.31	-0.0199	-0.05	Storage Tank (4): Floating roof with TVP <11.0 psia	
					H2S	0.01	<0.01			0.06	<0.01	0.05	0		
New/Modified	Yes	TANKCAP	TANKCAP	Storage Tank Emission Cap	VOC		193.22				169.22	0	-24		
					H2S		0.16				0.94	0	0.78		
Consolidate	No	BT-201	BT-201	Bunker Oil Storage Tank BT-201	VOC			1.2		1.2		0	0	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	
Consolidate	No	BT-202	BT-202	Bunker Oil Storage Tank BT-202	VOC			1.2		1.2		0	0	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	
Consolidate	No	BT-203	BT-203	Bunker Oil Storage Tank BT-203	VOC			1.2		1.2		0	0	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	
Consolidate	Yes	TANKCAP2	TANKCAP2	Storage Tank Emission Cap 2	VOC				10.23		10.23	0	0		
Not New/Modified	Yes	TRUCKLOAD	TRUCKLOAD	Uncollected Tank Truck Loading	VOC	2.91	0.04			2.91	0.04	0	0	Loading: Truck	
					H2S	<0.01	<0.01			0.01	<0.01	0	0		
New/Modified	Yes	VCU-4	VCU-4	Controlled Truck Load, Roof Landings, & Tank Degas	VOC	3.51	0.28			3.51	0.28	0	0	Control: Vapor Combustor	
					NOx	2.28	0.46			2.44	0.48	0.16	0.02		
					CO	1.53	0.34			1.64	0.35	0.11	0.01		
					PM	0.17	0.03			0.18	0.03	0.01	0		
					PM10	0.17	0.03			0.18	0.03	0.01	0		
					PM2.5	0.17	0.03			0.18	0.03	0.01	0		
					SO2	4.9	0.27			7.16	0.3	2.26	0.03		
					H2S	<0.01	<0.01			0.01	<0.01	0	0		
New/Modified	Yes	FUG	FUG	Equipment Fugitives	VOC	2.16	9.48	0.48	1.93	2.52	10.88	-0.12	-0.53	Fugitives: Piping and Equipment Leak	
					H2S	<0.01	0.01			0.01	0.05	0	0.04		
New/Modified	Yes	PORTVC	PORTVC	Portable VCU for Controlled Roof Landings & Degas	VOC	1.57	0.46			1.57	0.45	0	-0.01	Control: Vapor Combustor	
					NOx	1.61	1.11			1.71	1.16	0.1	0.05		
					CO	1.07	0.73			1.14	0.76	0.07	0.03		
					PM	0.12	0.06			0.13	0.06	0.01	0		
					PM10	0.12	0.06			0.13	0.06	0.01	0		
					PM2.5	0.12	0.06			0.13	0.06	0.01	0		
					SO2	4.33	1.2			4.33	1.18	0	-0.02		
					H2S	<0.01	<0.01			<0.01	<0.01	0	0		
New/Modified	No	EQDEGAS	MSS-CONT	Equipment MSS Vapors Vented	VOC	0.52	0.01			0.52	0.01	0	0	MSS: Pipe, VOC > 0.5 PSIa	
					NOx	0.98	0.02			1.05	0.02	0.0701	0		
					CO	0.66	0.01			0.7	0.02	0.04	0.01		
					PM	0.07	<0.01			0.08	<0.01	0.01	0		
					PM10	0.07	<0.01			0.08	<0.01	0.01	0		
					PM2.5	0.07	<0.01			0.08	<0.01	0.01	0		
					SO2	0.82	0.02			0.82	0.02	0	0		
					H2S	<0.01	<0.01			<0.01	<0.01	0	0		

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New/Modified	No	EQREFILL	MSS-CONT	Equipment MSS Refilling	VOC	0.31	0.01			0.31	0.01	0	0	MSS: Pump, VOC > 0.5 PSIa	
					NOx	0.53	0.01			0.63	0.01	0.1	0		
					CO	0.39	0.01			0.42	0.01	0.03	0		
					PM	0.04	<0.01			0.05	<0.01	0.01	0		
					PM10	0.04	<0.01			0.05	<0.01	0.01	0		
					PM2.5	0.04	<0.01			0.05	<0.01	0.01	0		
					SO2	0.49	0.01			0.49	0.01	0	0		
					H2S	<0.01	<0.01			<0.01	<0.01	0	0		
New/Modified	No	AIRVACMV	MSS-CONT	Air Mover and Vacuum Truck MSS	VOC	0.17	0.01			0.17	0.01	0	0	MSS Activities	
					NOx	0.31	0.01			0.33	0.01	0.02	0		
					CO	0.21	0.01			0.22	0.01	0.01	0		
					PM	0.02	<0.01			0.02	<0.01	0	0		
					PM10	0.02	<0.01			0.02	<0.01	0	0		
					PM2.5	0.02	<0.01			0.02	<0.01	0	0		
					SO2	0.26	0.01			0.26	0.01	0	0		
					H2S	<0.01	<0.01			<0.01	<0.01	0	0		
New/Modified	No	FRACTKS	MSS-CONT	Frac Tank Emissions	VOC	0.2	0.03			0.2	0.03	0	0	Storage Tank (2): Fixed roof with capacity ≥ 25,000 gal and 0.50 psia < TVP < 11.0 psia	
					NOx	0.38	0.06			0.4	0.06	0.02	0		
					CO	0.25	0.04			0.27	0.04	0.02	0		
					PM	0.03	<0.01			0.03	<0.01	0	0		
					PM10	0.03	<0.01			0.03	<0.01	0	0		
					PM2.5	0.03	<0.01			0.03	<0.01	0	0		
					SO2	0.32	0.06			0.32	0.06	0	0		
					H2S	<0.01	<0.01			<0.01	<0.01	0	0		
Not New/Modified	No	MSS-CONT	MSS-CONT	Pilot Emissions	VOC	<0.01	0.01			<0.01	0.01	0	0	Control: Vapor Combustor	
					NOx	0.04	0.17			0.04	0.17	0	0		
					CO	0.02	0.1			0.02	0.1	0	0		
					PM	<0.01	0.01			<0.01	0.01	0	0		
					PM10	<0.01	0.01			<0.01	0.01	0	0		
					PM2.5	<0.01	0.01			<0.01	0.01	0	0		
					SO2	<0.01	<0.01			<0.01	<0.01	0	0		
New/Modified	Yes	MSS-CONT	MSS-CONT	Controlled MSS Cap	VOC		0.07				0.07	0	0		
					NOx		0.27				0.28	0	0.01		
					CO		0.17				0.17	0	0		
					PM		0.02				0.02	0	0		
					PM10		0.02				0.02	0	0		
					PM2.5		0.02				0.02	0	0		
					SO2		0.1				0.1	0	0		
					H2S		<0.01				<0.01	0	0		
New/Modified	No	EQVENT	MSS-ATM	Equipment MSS Vapors Vented	VOC	102.11	1.09	6.32	0.13	102.11	1.22	-6.32	0	MSS: Pipe, VOC > 0.5 PSIa	
					H2S	0.09	<0.01			0.09	<0.01	0	0		
New/Modified	No	EQDRAIN	MSS-ATM	Equipment Draining	VOC	20.12	0.3	0.2	0.00307	20.12	0.31	-0.2	0.007	MSS: Pump, VOC > 0.5 PSIa	
					H2S	0.02	<0.01			0.02	<0.01	0	0		
Not New/Modified	No	EQDGSATM	MSS-ATM	Equp Vapor Space Emis (to Atm Post Control)	VOC	8.94	0.18			8.94	0.18	0	0	MSS: Valve, VOC > 0.5 PSIa	
					H2S	0.01	<0.01			0.01	<0.01	0	0		
New/Modified	No	EQREFATM	MSS-ATM	Equipment MSS Refilling	VOC	61.27	0.66	3.79	0.08	61.27	0.73	-3.79	-0.01	MSS: Pump, VOC > 0.5 PSIa	
					H2S	0.05	<0.01			0.05	<0.01	0	0		
New/Modified	No	Tanks	MSS-ATM	Uncontrolled Venting from Storage Tank Degassing	VOC	257.41	5.45	421.99	0.63	210.96	5.48	-468.44	-0.6	MSS Activities	
					H2S	0.27	<0.01			0.24	0.01	-0.03	0		
Not New/Modified	No	Misc	MSS-ATM	Misc. Inherently Low Emitting Maint Activities	VOC	21.36	0.21			21.36	0.21	0	0	MSS Activities	
					H2S	0.02	<0.01			0.02	<0.01	0	0		
New/Modified	Yes	MSS-ATM	MSS-ATM	Uncontrolled MSS Emission Cap	VOC	471.2	7.9			424.76	8.13	-46.44	0.23		
					H2S	0.45	<0.01			0.42	0.01	-0.03	0		
Not New/Modified	Yes	BLAST	BLAST	MSS Abrasive Blasting	PM	4.29	4.86			4.29	4.86	0	0	MSS Activities	
					PM10	0.51	0.58			0.51	0.58	0	0		
					PM2.5	0.08	0.09			0.08	0.09	0	0		
Not New/Modified	Yes	HOPPER	HOPPER	MSS Hopper Loading	PM	0.14	0.01			0.14	0.01	0	0	Other	Hopper
					PM10	0.08	0.01			0.08	0.01	0	0		
					PM2.5	0.01	0.01			0.01	0.01	0	0		

Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)	Unit Type Notes (only if "other" unit type in Column O)
Not New/Modified	Yes	BLASTLOAD	BLASTLOAD	MSS Blast Pot Loading	PM	0.09	0.01			0.09	0.01	0	0	Other	Material Handling: Drop Point
					PM10	0.03	0.01			0.03	0.01	0	0		
					PM2.5	0.01	0.01			0.01	0.01	0	0		
Not New/Modified	Yes	ROLLOFF	ROLLOFF	MSS Roll-off Box Loading	PM	0.09	0.01			0.09	0.01	0	0	Other	Material Handling: Drop Point
					PM10	0.03	0.01			0.03	0.01	0	0		
					PM2.5	0.01	0.01			0.01	0.01	0	0		

Emission Point Discharge Parameters												
EPN	Included in EMEW?	UTM Coordinates Zone	East (Meters)	North (Meters)	Building Height (ft)	Height Above Ground (ft)	Stack Exit Diameter (ft)	Velocity (FPS)	Temperature (°F)	Fugitives - Length (ft)	Fugitives - Width (ft)	Fugitives - Axis Degrees
DOCK-2	Yes											
DOCK-4	Yes											
DOCK-5	Yes											
DOCK-2LO	Yes											
DOCK-4LO	Yes											
DOCK-5LO	Yes											
DOCK CAP												
VCU-1	Yes											
VCU-2	Yes											
VCU-3	Yes											
VCU-5	Yes											
VCU-6	Yes											
VCU-7	Yes											
VCU-8	Yes											
VCUCAP												
T-101	Yes											
T-102	Yes											
T-103	Yes											
T-104	Yes											
T-105	Yes											
T-106	Yes											
T-107	Yes											
T-108	Yes											
T-109	Yes											
T-110	Yes											
T-111	Yes											
T-112	Yes											
T-113	Yes											
T-114	Yes											
T-115	Yes											
T-116	Yes											
T-117	Yes											
T-118	Yes											
T-119	Yes											
T-120	Yes											
T-121	Yes											
T-122	Yes											
T-123	Yes											
T-124	Yes											
T-125	Yes											
T-126	Yes											
T-127	Yes											

EPN	Included in EMEW?	UTM Coordinates Zone	East (Meters)	North (Meters)	Building Height (ft)	Height Above Ground (ft)	Stack Exit Diameter (ft)	Velocity (FPS)	Temperature (°F)	Fugitives - Length (ft)	Fugitives - Width (ft)	Fugitives - Axis Degrees
T-128	Yes											
T-129	Yes											
T-130	Yes											
T-131	Yes											
T-132	Yes											
T-133	Yes											
T-134	Yes											
T-135	Yes											
T-136	Yes											
T-137	Yes											
T-138	Yes											
T-139	Yes											
T-140	Yes											
T-141	Yes											
T-142	Yes											
T-143	Yes											
T-144	Yes											
T-201	Yes											
T-202	Yes											
RT-1	Yes											
RT-2	Yes											
TANKCAP												
BT-201	Yes											
BT-202	Yes											
BT-203	Yes											
TANKCAP2												
TRUCKLOAD	Yes											
VCU-4	Yes											
FUG	Yes											
PORTVC	Yes											
MSS-CONT	Yes											
MSS-ATM	Yes											
BLAST	No	15	677239	3080099		3.28				72.18	147.64	21.5
HOPPER	No	15	677239	3080099		3.28				72.18	147.64	21.5
BLASTLOAD	No	15	677239	3080099		3.28				72.18	147.64	21.5
ROLLOFF	No	15	677239	3080099		3.28				72.18	147.64	21.5

I. Public Notice Applicability

A. Application Type

Is this an application for a minor permit amendment?	Yes
Is there any change in character of emissions in this application (such as a new VOC or PM species)?	Yes
Is there a new air contaminant in this application (such as a newly emitted or newly quantified criteria pollutant)?	No

B. Project Increases and Public Notice Thresholds (for Initial and Amendment Projects)

For public notice applicability, the agency does not include consolidation or incorporation of any previously authorized facility or activity (PBR, standard permits, etc.), changes to permitted allowable emission rates when exclusively due to changes to standardized emission factors, or reductions in emissions which are not enforceable through the amended permit. Thus, the total emissions increase would be the sum of emissions increases under the amended permit and the emissions decreases under the amended permit for each air contaminant.

The table below will generate emission increases based on the values represented on the "Unit Types - Emission Rates" sheet. Use the "yes" and "no" options in column B of the "Unit Types - Emission Rates" worksheet to indicate if a unit's proposed change of emissions should be included in these totals.

Notes:
1. Emissions of PM, PM10, and/or PM2.5 may have been previously quantified and authorized as PM, PM10,and/or PM2.5. These emissions will be speciated based on current guidance and policy to demonstrate compliance with current standards and public notice requirements may change during the permit review.

This row is optional. If you do not think the table below accurately represents public notice applicability increases for your project, provide discussion here (1000 characters).	
Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetable fibers (agricultural facilities)?	No

Pollutant	Current Long-Term (tpy)	Consolidated Emissions (tpy)	Proposed Long-Term (tpy)	Project Change in Allowable (tpy)	PN Threshold	Notice required?
VOC	283.52	12.16	295.93	0.25	5	No
PM	10.12	0.00	12.05	1.93	5	No
PM_{10}	5.84	0.00	7.77	1.93	5	No
$PM_{2.5}$	5.35	0.00	7.28	1.93	5	No
NO_x	10.90	0.00	49.92	39.02	5	Yes
CO	5.40	0.00	11.76	6.36	50	No
SO_2	64.82	0.00	85.03	20.21	10	Yes
Pb	0.00	0.00	0.00	0.00	0.6	No
H2S	0.29	0	1.13	0.84	5	No

* Notice is required for PM, PM10, and PM2.5 if one of these pollutants is above the threshold.

** Notice of a GHG action is determined by action type. Initial and major modification always require notice. Voluntary updates require a consolidated notice if there is a change to BACT. Project emission increases of CO2e (CO2 equivalent) are not relevant for determining public notice of GHG permit actions.

D. Is public notice required for this project as represented in this PI-1? If no, proceed to Section III Small Business Classification. Note: public notice applicability for this project may change throughout the technical review.	Yes
E. Are any HAPs to be authorized/re-authorized with this project? The category "HAPs" must be specifically listed in the public notice if the project authorizes (reauthorizes for renewals) any HAP pollutants.	No

II. Public Notice Information

Complete this section if public notice is required (determined in the above section) or if you are not sure if public notice is required.

A. Contact Information

Enter the contact information for the **person responsible for publishing.** This is a designated representative who is responsible for ensuring public notice is properly published in the appropriate newspaper and signs are posted at the facility site. This person will be contacted directly when the TCEQ is ready to authorize public notice for the application.

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Clayton
Last Name:	Curtis
Title:	VP Regulatory Affairs
Company Name:	Moda Midstream, LLC
Mailing Address:	1000 Louisiana, Ste. 7100
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77002
Telephone Number:	832-930-4473
Fax Number:	
Email Address:	clayton.curtis@modamidstream.com

Enter the contact information for the **Technical Contact.** This is the designated representative who will be listed in the public notice as a contact for additional information.

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Clayton
Last Name:	Curtis
Title:	VP Regulatory Affairs
Company Name:	Moda Midstream, LLC
Mailing Address:	1000 Louisiana, Ste. 7100
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77002
Telephone Number:	832-930-4473
Fax Number:	
Email Address:	clayton.curtis@modamidstream.com

B. Public place

Place a copy of the full application (including the entire completed PI-1 and all attachments) at a public place in the county where the facilities are or will be located. You must state where in the county the application will be available for public review and comment. The location must be a public place and described in the notice. A public place is a location which is owned and operated by public funds (such as libraries, county courthouses, city halls) and cannot be a commercial enterprise. You are required to pre-arrange this availability with the public place indicated below. The application must remain available from the first day of publication through the designated comment period.

If this is an application for a PSD, nonattainment, or FCAA §112(g) permit, the public place must have internet access available for the public as required in 30 TAC § 39.411(f)(3).

If the application is submitted to the agency with information marked as Confidential, you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: ***Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the TCEQ Public Information Coordinator, MC 197, P.O. Box 13087, Austin, Texas 78711-3087.***

Name of Public Place:	Sinton Public Library
Physical Address:	1000 North Pirate Blvd
Address Line 2:	
City:	Sinton
ZIP Code:	78387
County:	San Patricio
Has the public place granted authorization to place the application for public viewing and copying?	Yes

C. Alternate Language Publication

In some cases, public notice in an alternate language is required. If an elementary or middle school nearest to the facility is in a school district required by the Texas Education Code to have a bilingual program, a bilingual notice will be required. If there is no bilingual program required in the school nearest the facility, but children who would normally attend those schools are eligible to attend bilingual programs elsewhere in the school district, the bilingual notice will also be required. If it is determined that alternate language notice is required, you are responsible for ensuring that the publication in the alternate language is complete and accurate in that language.

Is a bilingual program required by the Texas Education Code in the School District?	Yes
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	Yes
If yes to either question above, list which language(s) are required by the bilingual program.	Spanish
Enter the second required language, if applicable.	
Enter the third required language, if applicable.	
Enter the fourth required language, if applicable.	

III. Small Business Classification	
Complete this section to determine small business classification. If a small business requests a permit, agency rules (30 TAC § 39.603(f)(1)(A)) allow for alternative public notification requirements if all of the following criteria are met. If these requirements are met, public notice does not have to include publication of the prominent (12 square inch) newspaper notice.	
Does the company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	No
Small business classification:	**No**

I. County Classification

Does the project require retrospective review?	Yes
If so, what is the issuance date of the project being revisited? (xx/xx/xx)	12/6/2019
If so, select the nonattainment classification of the county when the project being revisited was authorized.	attainment
The PI-1 accomodates one retrospective review. If the project includes multiple, provide an attachment listing the additional issuance dates, classifications at the time of authorization, and offset data for each additional retrospective review in the project.	
County (completed for you from your response on the General sheet)	San Patricio

II. PSD and GHG PSD Applicability Summary

Is netting required for the PSD analysis for this project? **No**

Pollutant	Project Increase	Threshold	PSD Review Required?
CO	-153.22	100	No
NO_x	-42.36	40	No
PM	1.16	25	No
PM_{10}	1.16	15	No
$PM_{2.5}$	1.16	10	No
SO_2	3.56	40	No
Ozone (as VOC)	-24.93	40	No
Ozone (as NOx)	-42.36	40	No
Pb			
H_2S	-0.78	10	No
TRS			
Reduced sulfur compounds (including H_2S)			
H_2SO_4			
Fluoride (excluding HF)			
CO2e			

I. Expedited Permitting Request	
Are you requesting to expedite this project?	No

II. General Information - Non-Renewal	
Is this project for new facilities controlled and operated directly by the federal government? (30 TAC § 116.141(b)(1) and 30 TAC § 116.163(a))	No
A fee of $75,000 shall be required if no estimate of capital project cost is included with the permit application. (30 TAC § 116.141(d)) Select "yes" here to use this option.	No
Select Application Type	Minor Application

III. Direct Costs - Non-Renewal	
Type of Cost	**Amount**
Process and control equipment not previously owned by the applicant and not currently authorized under this chapter.	$0.00
Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements.	$0.00
Freight charges.	$0.00
Site preparation, including demolition, construction of fences, outdoor lighting, road, and parking areas.	$0.00
Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment.	$0.00
Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures.	$0.00
Ambient air monitoring network.	$0.00
Sub-Total:	$0.00

IV. Indirect Costs - Non-Renewal	
Type of Cost	**Amount**
Final engineering design and supervision, and administrative overhead.	$0.00
Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up.	$0.00
Contractor's fee and overhead.	$0.00
Sub-Total:	$0.00

V. Calculations - Non-Renewal

For GHG permits: A single PSD fee (calculated on the capital cost of the project per 30 TAC § 116.163) will be required for all of the associated permitting actions for a GHG PSD project. Other NSR permit fees related to the project that have already been remitted to the TCEQ can be subtracted when determining the appropriate fee to submit with the GHG PSD application. Identify these other fees in the GHG PSD permit application.

In signing the "General" sheet with this fee worksheet attached, I certify that the total estimated capital cost of the project as defined in 30 TAC §116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines Criminal Offenses for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Estimated Capital Cost	Minor Application Fee	
Less than $300,000	$900 (minimum fee)	
$300,000 - $7,500,000	N/A	
$300,000 - $25,000,000	0.30% of capital cost	
Greater than $7,500,000	N/A	
Greater than $25,000,000	$75,000 (maximum fee)	

Your estimated capital cost:	**$0.00**	Minimum fee applies.
Permit Application Fee:		**$900.00**

VII. Total Permit Fees

Note: fees can be paid together with one payment or as two separate payments.	
Non-Renewal Fee	$900.00
Total	$900.00

VIII. Payment Information

A. Payment One (required)	
Was the fee paid online?	Yes
Enter the fee amount:	$ 900.00
Enter the check, money order, ePay Voucher, or other transaction number (enter "STEERS" if submitting and paying through STEERS):	STEERS
Enter the Company name as it appears on the check:	N/A

C. Total Paid	**$900.00**

IX. Professional Engineer Seal Requirement	
Is the estimated capital cost of the project above $2 million?	No
Is the application required to be submitted under the seal of a Texas licensed P.E.? Note: an electronic PE seal is acceptable.	No

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes
VOC	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
H2S	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
NOx	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
CO	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
PM	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
PM10	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
PM2.5	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).
SO2	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	DOCK-2LO	Loading: Marine Vessel	VOC	VOC >= 0.5 psia: Route to VOC control device and meet the specific control device requirements. Vessel leak testing: the marine vessel must pass an annual vapor tightness test as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f). During loading of inerted marine vessels, the owner or operator of the marine terminal or of the marine vessel shall conduct AVO checks for leaks once every 8 hours for on-shore equipment and on board the vessel. The pressure at the vapor collection connection and the loading rate must be monitored and recorded. See Marine Terminal Guidance dated September 21, 2016 for emission factors for ship-side emissions. Federal Coast Guard Regulation require ocean-going vessels to be inerted. Therefore, ocean-going vessels cannot use vacuum loading.	Yes	
			MSS	Same as normal operation BACT requirements.	Yes	
New/Modified	DOCK-4LO	Loading: Marine Vessel	VOC	VOC >= 0.5 psia: Route to VOC control device and meet the specific control device requirements. Vessel leak testing: the marine vessel must pass an annual vapor tightness test as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f). During loading of inerted marine vessels, the owner or operator of the marine terminal or of the marine vessel shall conduct AVO checks for leaks once every 8 hours for on-shore equipment and on board the vessel. The pressure at the vapor collection connection and the loading rate must be monitored and recorded. See Marine Terminal Guidance dated September 21, 2016 for emission factors for ship-side emissions. Federal Coast Guard Regulation require ocean-going vessels to be inerted. Therefore, ocean-going vessels cannot use vacuum loading.	Yes	
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	DOCK-5LO	Loading: Marine Vessel	VOC	VOC >= 0.5 psia: Route to VOC control device and meet the specific control device requirements. Vessel leak testing: the marine vessel must pass an annual vapor tightness test as specified in 40 CFR §63.565(c) or 40 CFR §61.304(f). During loading of inerted marine vessels, the owner or operator of the marine terminal or of the marine vessel shall conduct AVO checks for leaks once every 8 hours for on-shore equipment and on board the vessel. The pressure at the vapor collection connection and the loading rate must be monitored and recorded. See Marine Terminal Guidance dated September 21, 2016 for emission factors for ship-side emissions. Federal Coast Guard Regulation require ocean-going vessels to be inerted. Therefore, ocean-going vessels cannot use vacuum loading.	Yes	
			MSS	Same as normal operation BACT requirements.		
New/Modified	DOCK CAP	0	VOC	See additional notes:		Emissions cap
			H2S	See additional notes:		Emissions cap
			MSS	See additional notes:		Emissions cap
New/Modified	VCU-1	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	VCU-2	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	
New/Modified	VCU-3	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	VCU-5	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	
New/Modified	VCU-6	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	VCU-7	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	
Consolidate	VCU-8	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	
New/Modified	VCUCAP	0	VOC	See additional notes:		Emissions cap
			NOx	See additional notes:		Emissions cap
			CO	See additional notes:		Emissions cap
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:		Emissions cap
			SO2	See additional notes:		Emissions cap
			H2S	See additional notes:		Emissions cap
			MSS	See additional notes:		Emissions cap

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-101	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-102	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-103	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-104	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-105	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-106	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Texas Commission on Environmental Quality
Form PI-1 General Application
BACT

Date: January 22, 2021
Permit #: 122362/PSDTX1430M1
Company: Moda Ingleside, LLC

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-107	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-108	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-109	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-110	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-111	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-112	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-113	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-114	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-115	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-116	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-117	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-118	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-119	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-120	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-121	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-122	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-123	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-124	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-125	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-126	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-127	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-128	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-129	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-130	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-131	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-132	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-133	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-134	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-135	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-136	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-137	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-138	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-139	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-140	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-141	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-142	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-143	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-144	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-201	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	T-202	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seal is primary mechanical-shoe.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	RT-1	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	RT-2	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Specify tank type. 1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Drain dry design (new tanks only). Specify seals: Alternative 1: Primary seal mechanical or liquid mounted. Alternative 2: Primary seal vapor mounted and secondary seal rim mounted. 2. External floating roof: Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Slotted guide pole fittings must have gasketed cover and at least two of the following (specify selection): wiper, float, or sleeve. Specify seals: Primary seal mechanical or liquid mounted, secondary seal rim mounted. Drain dry design (new tanks only).	Yes	1. Internal floating roof: Uninsulated exterior surfaces exposed to the sun shall be white. Drain dry design. Seals are primary seal vapor mounted with secondary seal rim mounted.
			H2S	See Additional Notes:	Yes	Products shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.
			MSS	Unless specified below, route to appropriate control device when degassing. Control must be maintained until the VOC concentration is less than 10,000 ppmv VOC (or equivalent for non-VOCs). If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Route to control device during roof refloating if emissions from filling tanks without degassing and cleaning is > 5tpy. In this case, if controlling through fixed roof vent, route to control device during entire tank refill. New tanks must be designed to be drain dry with connections to control vapors under a landed roof. Commence under-roof degassing within 24 hours of landing. Degas every 24 hours unless no standing liquid in tank or vapor pressure of liquid in tank has a VOC partial pressure <0.02 psi. Floating roof tank landings at bulk gasoline terminals: May land roof without control for two landings per tank per year when required for Reid Vapor Pressure changes. Floating roof tank landing, change of service: May land roof without control for a change of service (incompatible liquids) if total site change of service tank landing emissions are less than 5 tpy.	Yes	
New/Modified	TANKCAP	0	VOC	See additional notes:		Emissions cap
			H2S	See additional notes:		Emissions cap
			MSS	See additional notes:		Emissions cap

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
Consolidate	BT-201	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Fixed roof with submerged fill. Uninsulated exterior surfaces exposed to the sun shall be white or aluminum.	Yes	
			MSS	Same as normal operation BACT requirements except as listed below. Fixed roof tank draining: VOC: Send liquid to a covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Control device must meet BACT. Acid: Drain to covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the acid vapor pressure is less than 0.02 psia. Control device must meet BACT.	Yes	
Consolidate	BT-202	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Fixed roof with submerged fill. Uninsulated exterior surfaces exposed to the sun shall be white or aluminum.	Yes	
			MSS	Same as normal operation BACT requirements except as listed below. Fixed roof tank draining: VOC: Send liquid to a covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Control device must meet BACT. Acid: Drain to covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the acid vapor pressure is less than 0.02 psia. Control device must meet BACT.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
Consolidate	BT-203	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Fixed roof with submerged fill. Uninsulated exterior surfaces exposed to the sun shall be white or aluminum.	Yes	
			MSS	Same as normal operation BACT requirements except as listed below. Fixed roof tank draining: VOC: Send liquid to a covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Control device must meet BACT. Acid: Drain to covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the acid vapor pressure is less than 0.02 psia. Control device must meet BACT.	Yes	
Consolidate	TANKCAP2	0	VOC	See additional notes:		Emissions cap
			MSS	See additional notes:		Emissions cap
New/Modified	VCU-4	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	FUG	Fugitives: Piping and Equipment Leak	VOC	Specify which is applicable: 1. Uncontrolled VOC emissions < 10 tpy: none 2. 10 tpy < uncontrolled VOC emissions < 25 tpy: 28M leak detection and repair program. 75% credit for 28M. 3. Uncontrolled VOC emissions > 25 tpy: 28VHP leak detection and repair program. 97% credit for valves, 85% for pumps and compressors. 4. VOC vp < 0.002 psia: no inspection required, no fugitive emissions expected. For emissions of approved odorous compounds (chlorine, ammonia, hydrogen sulfide, hydrogen cyanide and mercaptans only): AVO inspection twice per shift. Appropriate credit for AVO program.	Yes	3. Uncontrolled VOC emissions > 25 tpy: 28VHP leak detection and repair program.
			H2S	AVO inspection twice per shift. Appropriate credit for AVO program.	Yes	
			MSS	Same as normal operation BACT requirements.	Yes	
New/Modified	PORTVC	Control: Vapor Combustor	VOC	99% destruction efficiency. Monitor temperature. Perform initial test.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	EQDEGAS	MSS: Pipe, VOC > 0.5 PSIa	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Route the vapors back through the process to be recovered before going to the flare using the recovery compressors, where available. Route vapors to flare. Route liquids to slop drums or strippers. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container. Alternative 1: Drain material to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container. Alternative 2: Send the material to the refinery slop drums to be recovered. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	See Additional Notes:	Yes	This is an MSS source
New/Modified	EQREFILL	MSS: Pump, VOC > 0.5 PSIa	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Vapors are routed to flare. Liquids go to slop drums or strippers. Drain any remaining liquid it to a pan then pump to a vacuum truck or put in a closed container. Alternative 1: Send the material to the refinery slop drums to be recovered. If there is any remaining liquid in the system, drain it to a pan then pump to a vacuum truck or put in a closed container. Alternative 2: Drain to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan then pump to a vacuum truck or put in a closed container. Alternative 3: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any liquids remain, steam or drain to a pan, then pump to vacuum truck or put in closed container.	Yes	
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	See Additional Notes:	Yes	This is an MSS source

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	AIRVACMV	MSS Activities	VOC	See Additional Notes:	Yes	Routed to a control device (VCU) that meets 99% DRE.
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Not required since this is a MSS unit type.	Yes	
New/Modified	FRACTKS	Storage Tank (2): Fixed roof with capacity ≥ 25,000 gal and 0.50 psia < TVP < 11.0 psia	VOC	Fixed roof with submerged fill. Uninsulated exterior surfaces exposed to the sun shall be white or aluminum. Vent to control. Specify control and efficiency.	Yes	Routed to a control device (VCU) that meets 99% DRE.
			NOx	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize NOx
			CO	See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize CO
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Use of sweet natural gas as fuel, good combustion practice to minimize PM
			SO2	See Additional Notes:	Yes	SO2 results from combusting vapors containing H2S. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			H2S	See Additional Notes:	Yes	Thermal control will destroy a minimum of 98% of H2S vapors. Vapors containing H2S concentration that is too high will first be controlled using a scrubber.
			MSS	Same as normal operation BACT requirements except as listed below. Fixed roof tank draining: VOC: Send liquid to a covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia. Control device must meet BACT. Acid: Drain to covered vessel. If there is any standing liquid within the tank, and the tank is opened to the atmosphere or ventilated, the vapor stream must be controlled until there is no standing liquid or the acid vapor pressure is less than 0.02 psia. Control device must meet BACT.	Yes	

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	MSS-CONT	0	VOC	See additional notes:		Emissions cap
			NOx	See additional notes:		Emissions cap
			CO	See additional notes:		Emissions cap
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:		Emissions cap
			SO2	See additional notes:		Emissions cap
			H2S	See additional notes:		Emissions cap
			MSS	See additional notes:		Emissions cap
New/Modified	EQVENT	MSS: Pipe, VOC > 0.5 PSIa	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Route the vapors back through the process to be recovered before going to the flare using the recovery compressors, where available. Route vapors to flare. Route liquids to slop drums or strippers. Drain any remaining liquid to a pan, then pump to a vacuum truck or put in a closed container. Alternative 1: Drain material to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container. Alternative 2: Send the material to the refinery slop drums to be recovered. Drain any remaining liquid to a pan, then pump the material to a vacuum truck or put in a closed container.	Yes	
			H2S	See Additional Notes:	Yes	Schedule maintenance events to occur after low H2S product throughput to minimize H2S to the atmosphere.
			MSS	See Additional Notes:	Yes	This is an MSS source

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	EQDRAIN	MSS: Pump, VOC > 0.5 PSIa	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Vapors are routed to flare. Liquids go to slop drums or strippers. Drain any remaining liquid it to a pan then pump to a vacuum truck or put in a closed container. Alternative 1: Send the material to the refinery slop drums to be recovered. If there is any remaining liquid in the system, drain it to a pan then pump to a vacuum truck or put in a closed container. Alternative 2: Drain to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan then pump to a vacuum truck or put in a closed container. Alternative 3: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any liquids remain, steam or drain to a pan, then pump to vacuum truck or put in closed container.	Yes	
			H2S	See Additional Notes:	Yes	Schedule maintenance events to occur after low H2S product throughput to minimize H2S to the atmosphere.
			MSS	See Additional Notes:	Yes	This is an MSS source
New/Modified	EQREFATM	MSS: Pump, VOC > 0.5 PSIa	VOC	Send material to the flare knockout drum to separate into vapors, light liquids, and heavy liquids. Vapors are routed to flare. Liquids go to slop drums or strippers. Drain any remaining liquid it to a pan then pump to a vacuum truck or put in a closed container. Alternative 1: Send the material to the refinery slop drums to be recovered. If there is any remaining liquid in the system, drain it to a pan then pump to a vacuum truck or put in a closed container. Alternative 2: Drain to a recovery tank that is vented to the flare. Drain any remaining liquid to a pan then pump to a vacuum truck or put in a closed container. Alternative 3: Steam material to the enclosed sewer. Collect hydrocarbons in the unit sump, to be pumped to the slop tanks and recycled. If any liquids remain, steam or drain to a pan, then pump to vacuum truck or put in closed container.	Yes	
			H2S	See Additional Notes:	Yes	Schedule maintenance events to occur after low H2S product throughput to minimize H2S to the atmosphere.
			MSS	See Additional Notes:	Yes	This is an MSS source

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	Tanks	MSS Activities	VOC	See Additional Notes:	Yes	MSS BACT from storage tanks is covered under each storage tank listing.
			H2S	See Additional Notes:	Yes	MSS BACT from storage tanks is covered under each storage tank listing.
			MSS	Not required since this is a MSS unit type.	Yes	This is an MSS source
New/Modified	MSS-ATM	0	VOC	See additional notes:	Yes	This source is inherently low emitting maintenance activities. Due to the already low emissions per event, no BACT would be practicable.
			H2S	See additional notes:	Yes	This source is inherently low emitting maintenance activities. Due to the already low emissions per event, no BACT would be practicable.
			MSS	See additional notes:	Yes	This is an MSS source

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
DOCK-2LO	Loading: Marine Vessel	VOC	Temperature and Hourly volume loaded for each product. Observation for connection leaks. . Where vapor routed to control, copy of annual vessel vapor tightness certification. Where 99% or greater capture claimed AVO check of vessel tanks for leaks and pressure monitoring of cargo tank. Vacuum monitoring for 100% capture, not required for pressure vessel loading. Ship loading testing required for non vacuum >99% capture claims.	Yes	
DOCK-4LO	Loading: Marine Vessel	VOC	Temperature and Hourly volume loaded for each product. Observation for connection leaks. . Where vapor routed to control, copy of annual vessel vapor tightness certification. Where 99% or greater capture claimed AVO check of vessel tanks for leaks and pressure monitoring of cargo tank. Vacuum monitoring for 100% capture, not required for pressure vessel loading. Ship loading testing required for non vacuum >99% capture claims.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
DOCK-5LO	Loading: Marine Vessel	VOC	Temperature and Hourly volume loaded for each product. Observation for connection leaks. . Where vapor routed to control, copy of annual vessel vapor tightness certification. Where 99% or greater capture claimed AVO check of vessel tanks for leaks and pressure monitoring of cargo tank. Vacuum monitoring for 100% capture, not required for pressure vessel loading. Ship loading testing required for non vacuum >99% capture claims.	Yes	
DOCK CAP	0	VOC	See additional notes:		Emissions cap
		H2S	See additional notes:		Emissions cap

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
VCU-1	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	
VCU-2	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
VCU-3	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	
VCU-5	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
VCU-6	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	
VCU-7	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
VCU-8	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	
VCUCAP	0	VOC	See additional notes:		Emissions cap
		NOx	See additional notes:		Emissions cap
		CO	See additional notes:		Emissions cap
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:		Emissions cap
		SO2	See additional notes:		Emissions cap
		H2S	See additional notes:		Emissions cap

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-101	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-102	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-103	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-104	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-105	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-106	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-107	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-108	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-109	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-110	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

Texas Commission on Environmental Quality
Form PI-1 General Application
Monitoring

Date: January 22, 2021
Permit #: 122362/PSDTX1430M1
Company: Moda Ingleside, LLC

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-111	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-112	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-113	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-114	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-115	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-116	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-117	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-118	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-119	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-120	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-121	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-122	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-123	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-124	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-125	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-126	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-127	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-128	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-129	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-130	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-131	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-132	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-133	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-134	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-135	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-136	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

Texas Commission on Environmental Quality
Form PI-1 General Application
Monitoring

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-137	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-138	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-139	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-140	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-141	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-142	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-143	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-144	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
T-201	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
T-202	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
RT-1	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
RT-2	Storage Tank (4): Floating roof with TVP <11.0 psia	VOC	Monitor and record throughput by material stored to record a monthly average. Monitor and record the monthly average temperature for each material stored if material or tank is heated.	Yes	
		H2S	Monitor H2S concentration in crude oil and oil vapor annually or within 60 days of changing the oil, whichever is more frequent.	Yes	
TANKCAP	0	VOC	See additional notes:		Emissions cap
		H2S	See additional notes:		Emissions cap

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
BT-201	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Stored material and throughput	Yes	
BT-202	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Stored material and throughput	Yes	
BT-203	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia	VOC	Stored material and throughput	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
TANKCAP2	0	VOC	See additional notes:		Emissions cap
VCU-4	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
FUG	Fugitives: Piping and Equipment Leak	VOC	Use EPA Method 21 to monitor for leaks from seals on pumps, compressors, agitator and valve seals on piping components in light liquid and gas VOC service quarterly. Gas or hydraulic check new and a replaced connectors prior to returning to service, or monitor with Method 21 within 15 days of returning to service. Leak detection and repair (LDAR) Program 28M has a leak definition where repair action is required at 10,000 ppmv. LDAR Program 28 VHP has a leak definition where repair action is required at 500 ppmv for valves and connectors and 2000 ppmv for pumps, compressors and agitators. Check connectors weekly using audio, visual or olfactory (AVO) senses to observe leaks. Record results and corrective action taken.	Yes	
		H2S	Look for leaks twice per shift using audio, visual or olfactory (AVO) senses to observe leaks. Record results and corrective action taken.	Yes	

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
PORTVC	Control: Vapor Combustor	VOC	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		NOx	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Continuous Exhaust Temperature Monitoring recorded in six minute averages. Visible emissions monitoring quarterly.	Yes	
		SO2	Continuous Exhaust Temperature Monitoring recorded in six minute averages. Waste gas flow monitor or operation record that provides flow by design.	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Continuous Exhaust Temperature Monitoring recorded in six minute averages.	Yes	
EQDEGAS	MSS: Pipe, VOC > 0.5 PSIa	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug.	Yes	
		NOx	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages. Visible emissions monitoring.
		SO2	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages.

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
EQREFILL	MSS: Pump, VOC > 0.5 PSIa	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug.	Yes	
		NOx	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages. Visible emissions monitoring.
		SO2	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages.

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
AIRVACMV	MSS Activities	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug. Where add on control is used for purge, monitoring consistent with device used and flow and firing rates monitored or potential calculated.	Yes	
		NOx	Where add on control is used for purge, monitoring consistent with device used and flow and firing rates monitored or potential calculated.	Yes	
		CO	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug. Where add on control is used for purge, monitoring consistent with device used and flow and firing rates monitored or potential calculated.	Yes	
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Blasting material and usage. Paint spray type and usage. Combustion firing rates. Differential pressure across PM control devices.	Yes	
		SO2	Where add on control is used for purge, monitoring consistent with device used and flow and firing rates monitored or potential calculated.	Yes	
		H2S	See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages.

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
FRACTKS	Storage Tank (2): Fixed roof with capacity ≥ 25,000 gal and 0.50 psia < TVP < 11.0 psia	VOC	Throughput for each material handled, hourly or monthly depending on emission potential permitted. Continuous temperature monitoring when material received or tank is heated or chilled above or bellow ambient temperatures. Specific monitoring of control device and capture system is associated with device used and design of capture system. MSS requires measurement of degassed tanks vapor concentration before opening to the atmosphere. Liquids residual must be checked, adjusted with measure diluent inputs or measured.	Yes	
		NOx	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		CO	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:	Yes	Continuous exhaust temperature monitoring recorded in six minute averages. Visible emissions monitoring.
		SO2	See Additional Notes:	Yes	Waste gas flow monitor and operation record that provides flow by design.
		H2S	Periodic measurement of H2S in liquid and vapor space above liquid annually or within 60 days of change in material stored. Where H2S is present.	Yes	
MSS-CONT	0	VOC	See additional notes:		Emissions cap
		NOx	See additional notes:		Emissions cap
		CO	See additional notes:		Emissions cap
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:		Emissions cap
		SO2	See additional notes:		Emissions cap
		H2S	See additional notes:		Emissions cap

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
EQVENT	MSS: Pipe, VOC > 0.5 PSIa	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug.	Yes	
		H2S	See Additional Notes:	Yes	Product H2S data will be maintained and H2S concentration in the vapor space monitored during degassing.
EQDRAIN	MSS: Pump, VOC > 0.5 PSIa	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug.	Yes	
		H2S	See Additional Notes:	Yes	Product H2S data will be maintained and H2S concentration in the vapor space monitored during degassing.

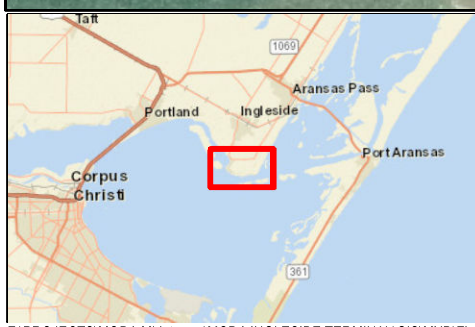
FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
EQREFATM	MSS: Pump, VOC > 0.5 PSIa	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug.	Yes	
		H2S	See Additional Notes:	Yes	Product H2S data will be maintained and H2S concentration in the vapor space monitored during degassing.
Tanks	MSS Activities	VOC	Requirement dependent on application representation. Vapor concentration measurement prior to opening to atmosphere may be required and/or emission potential may be recalculated. Each measurement and/or number of events monthly must be monitored. Must monitor open ended lines for leaks if open more than 72 hours without cap, blind flange or plug. Where add on control is used for purge, monitoring consistent with device used and flow and firing rates monitored or potential calculated.	Yes	
		H2S	See Additional Notes:	Yes	Product H2S data will be maintained and H2S concentration in the vapor space monitored during degassing.

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring
MSS-ATM	0	VOC	See additional notes:		Emissions cap
		H2S	See additional notes:		Emissions cap

Item	How submitted	Date submitted
A. Administrative Information		
Form PI-1 General Application	STEERS	01/22/2021
Hard copy of the General sheet with original (ink) signature	Not applicable	
Professional Engineer Seal	Not applicable	
B. General Information		
Copy of current permit (both Special Conditions and MAERT)		
Core Data Form	Not applicable	
Area map	STEERS	01/22/2021
Plot plan	STEERS	01/22/2021
Process description	STEERS	01/22/2021
Process flow diagram	STEERS	01/22/2021
List of MSS activities	STEERS	01/22/2021
State regulatory requirements discussion	STEERS	01/22/2021
C. Federal Applicability		
Summary and project emission increase determination - Tables 1F and 2F	Not applicable	
Netting analysis (if required) - Tables 3F and 4F as needed	Not applicable	
D. Technical Information		
BACT discussion, if additional details are attached	Not applicable	
Monitoring information, if additional details are attached	Not applicable	
Material Balance (if applicable)		
Calculations	STEERS	01/22/2021
E. Impacts Analysis		
Qualitative impacts analysis	Not applicable	
MERA analysis	FTPS	01/22/2021
EMEW: SCREEN3	Not applicable	
EMEW: NonSCREEN3	FTPS	01/22/2021
PSD modeling protocol	Not applicable	
F. Additional Attachments		

Appendix B

AREA MAP AND PLOT PLAN



Legend

Property Boundary

3000-ft. Property Boundary Buffer

N

0 1,000 2,000

Feet

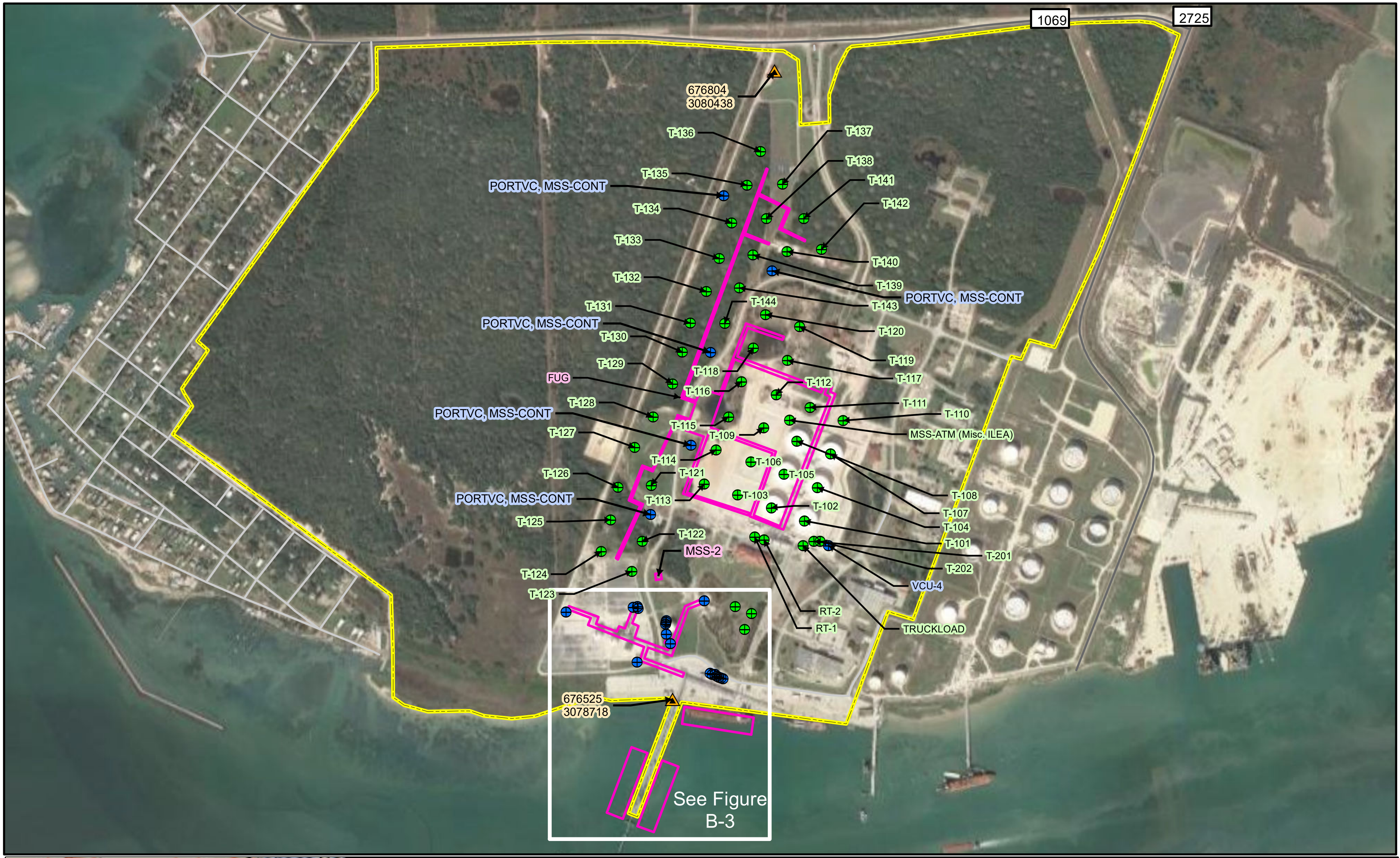
Scale: 1:28,000

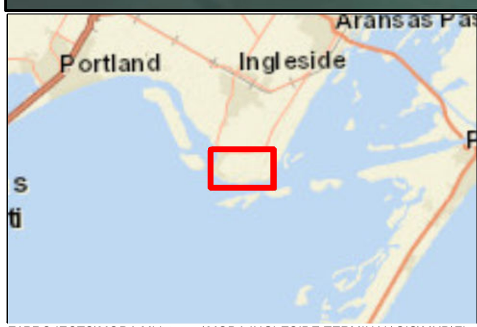
EDGE ENGINEERING & SCIENCE

Figure B-1
Area Map

Moda Ingleside, LLC
Moda Ingleside Energy Center
Ingleside, San Patricio County, Texas

Z:\PROJECTS\MODA Midstream\MODA INGLESIDE TERMINAL\GIS\MXD\Figure B-1 Area Map.mxd





Legend

- Point Source
- Volume Source
- Benchmark
- Area Source
- Property Boundary

N

0 500 1,000
Feet

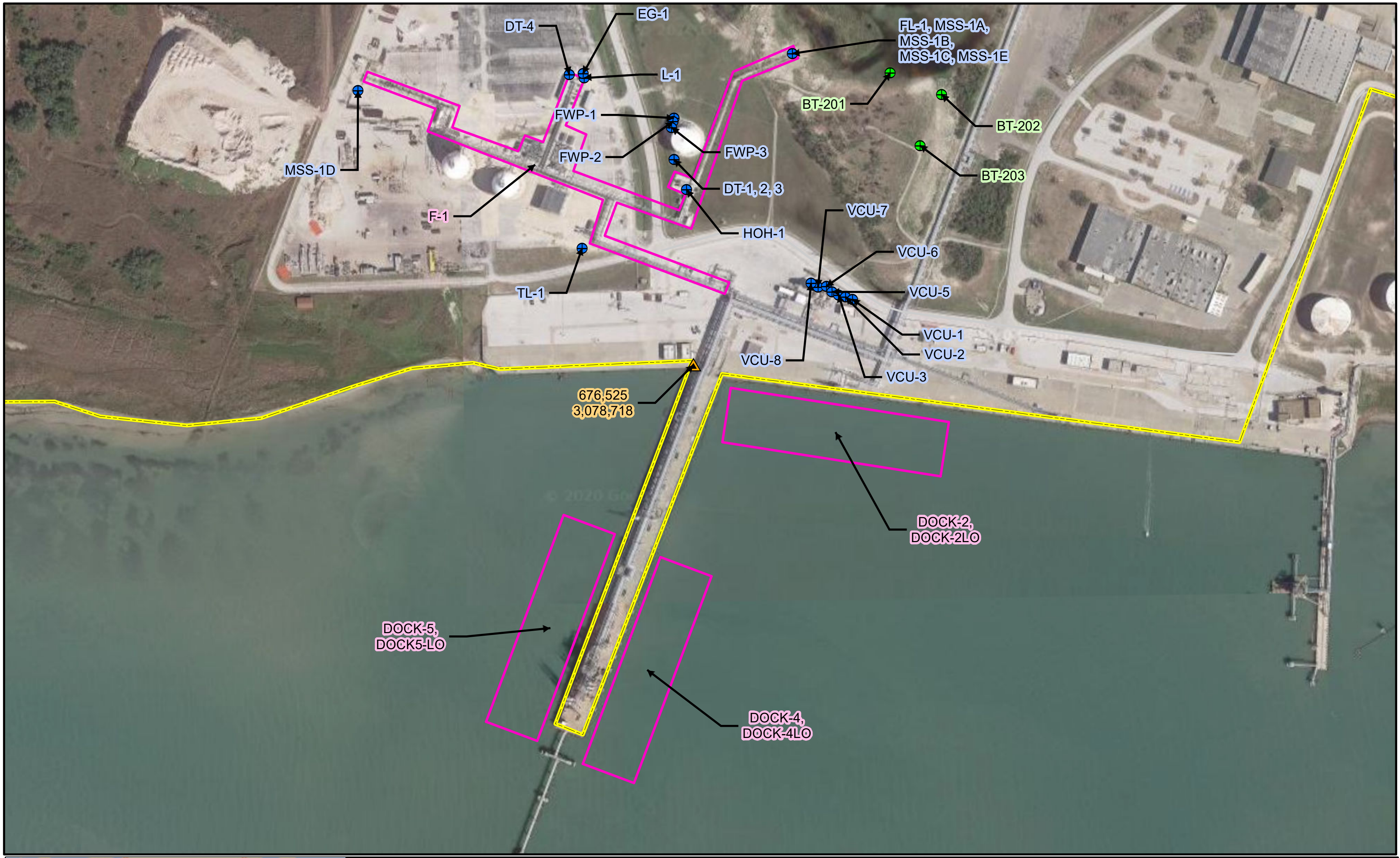
Scale: 1:15,000

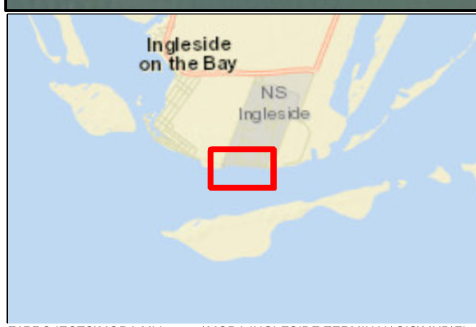
ENGINEERING & SCIENCE

Figure B-2
Plot Plan

Moda Ingleside, LLC
Moda Ingleside Energy Center
Ingleside, San Patricio County, Texas

Z:\PROJECTS\MODA Midstream\MODA INGLESIDE TERMINAL\GIS\MXD\Figure B-2 Plot Plan 01202021.mxd





Legend

- Point Source
- Volume Source
- Benchmark
- Area Source
- Property Boundary

N

0 250 500

Feet

Scale: 1:4,768

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Figure B-3
Plot Plan

Moda Ingleside, LLC
Moda Ingleside Energy Center
Ingleside, San Patricio County, Texas

Z:\PROJECTS\MODA Midstream\MODA INGLESIDE TERMINAL\GIS\MXD\Figure B-3 Plot Plan 01202021.mxd

Authorizations for EPNs in Plot Plan

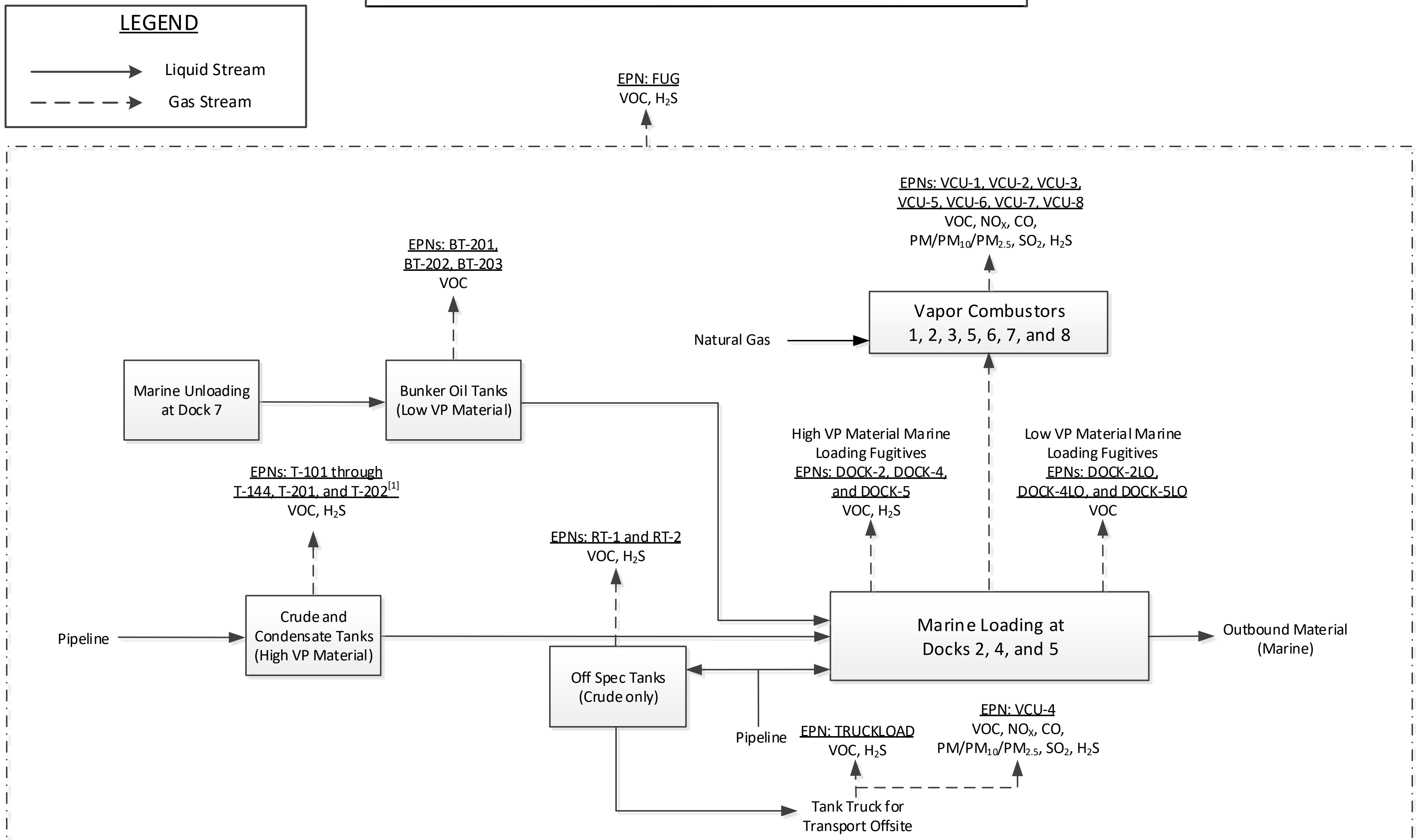
The table, below, lists all EPNs shown in the plot plan.

Emission Point					Notes
NSR 122362					
T-101	T-117	T-133	TANKCAP	VCU-6	
T-102	T-118	T-134	BT-201	VCU-7	
T-103	T-119	T-135	BT-202	VCU-8	
T-104	T-120	T-136	BT-203	VCUCAP	
T-105	T-121	T-137	TANKCAP2	TRUCKLOAD	
T-106	T-122	T-138	DOCK-2	VCU-4	Incorporated from PBR 159913: - BT-201, BT-202, BT-203
T-107	T-123	T-139	DOCK-4	PORTVC	
T-108	T-124	T-140	DOCK-5	FUG	
T-109	T-125	T-141	DOCK-2LO	MSS-CONT	Incorporated from NRSP for PCP 162551: - VCU-8
T-110	T-126	T-142	DOCK-4LO	MSS-ATM	
T-111	T-127	T-143	DOCK-5LO	BLAST	
T-112	T-128	T-144	DOCK CAP	HOPPER	
T-113	T-129	T-201	VCU-1	BLASTLOAD	
T-114	T-130	T-202	VCU-2	ROLLOFF	
T-115	T-131	RT-1	VCU-3		
T-116	T-132	RT-2	VCU-5		
PBR 117816					
F-1	FWP-2	DT-2	MSS-1A	MSS-1E	
FL-1	FWP-3	DT-3	MSS-1B	MSS-2	
TL-1	EG-1	DT-4	MSS-1C	MSS-3	Sources from the HD-5 Propane Terminal
HOH-1	DT-1	L-1	MSS-1D	MSS-4	
FWP-1					

Appendix C

PROCESS FLOW DIAGRAM

PROCESS FLOW DIAGRAM



Notes:
[1] Crude and condensate can be stored in all tanks, except the following which are crude only: T-101, T-102, T-104, T-105, T-107, T-108, T-201, T-202

Figure C-1
Routine Operations
Moda Ingleside, LLC
Moda Ingleside Energy Center
Ingleside, San Patricio County, Texas

EDGE ENGINEERING & SCIENCE

January 2021
Drawn by: JLR

PROCESS FLOW DIAGRAM

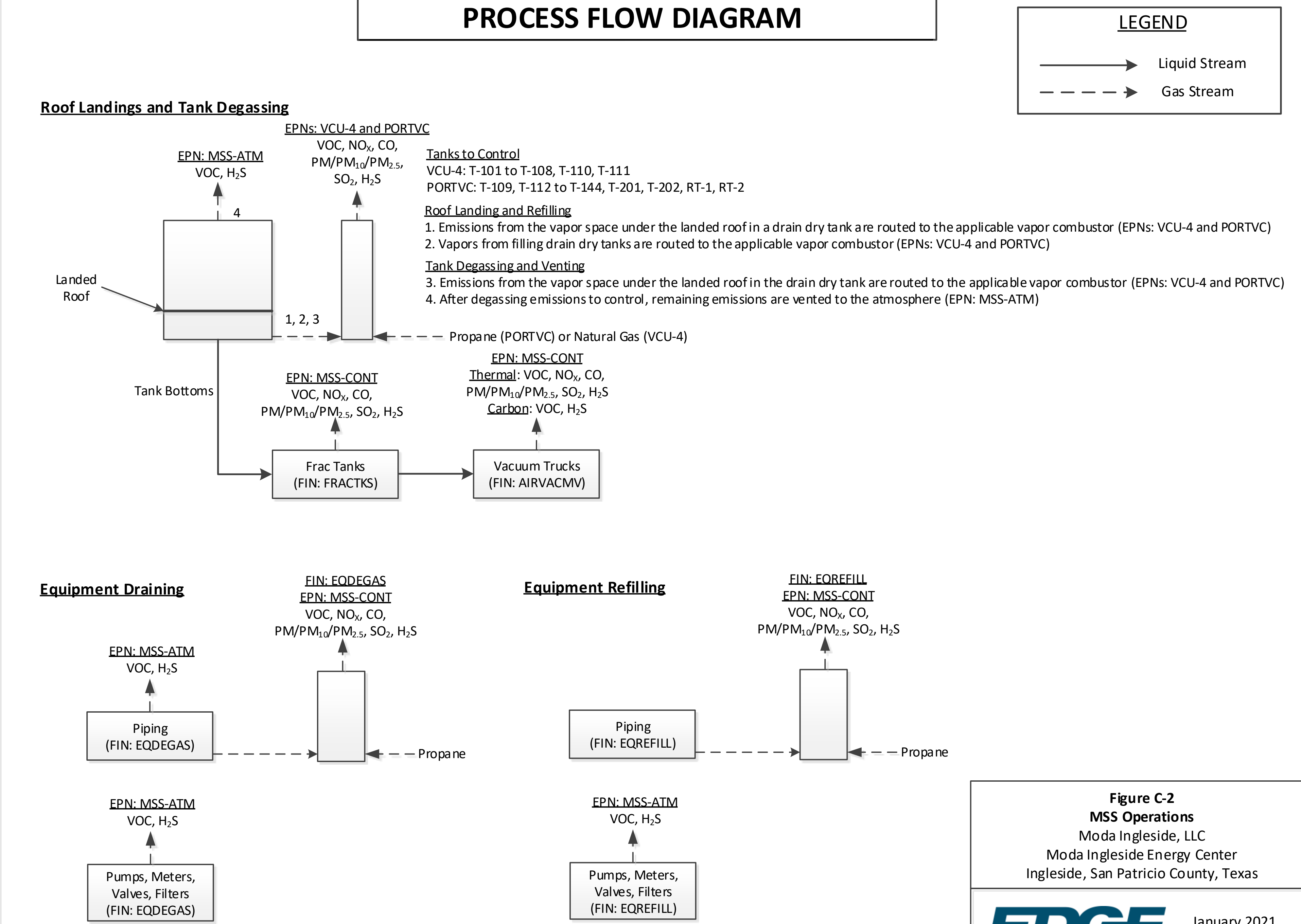


Figure C-2
MSS Operations
Moda Ingleside, LLC
Moda Ingleside Energy Center
Ingleside, San Patricio County, Texas

EDGE ENGINEERING & SCIENCE

January 2021
Drawn by: JLR

Appendix D

CURRENT AUTHORIZATION DOCUMENTATION

Texas Commission on Environmental Quality
Air Quality Permit

A Permit Is Hereby Issued To
Moda Ingleside, LLC
Authorizing the Construction and Operation of
Moda Ingleside Energy Center
Located at **Ingleside, San Patricio County, Texas**
Latitude 27° 49′ 30″ Longitude −97° 12′ 18″

Permits: 122362 and PSDTX1430M1

Amendment Date: November 30, 2020

Expiration Date: June 22, 2025

For the Commission

1. **Facilities** covered by this permit shall be constructed and operated as specified in the application for the permit. All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. Variations from these representations shall be unlawful unless the permit holder first makes application to the Texas Commission on Environmental Quality (commission) Executive Director to amend this permit in that regard and such amendment is approved. [Title 30 Texas Administrative Code (TAC) Section 116.116 (30 TAC § 116.116)] [1]
2. **Voiding of Permit**. A permit or permit amendment is automatically void if the holder fails to begin construction within 18 months of the date of issuance, discontinues construction for more than 18 months prior to completion, or fails to complete construction within a reasonable time. Upon request, the executive director may grant an 18-month extension. Before the extension is granted the permit may be subject to revision based on best available control technology, lowest achievable emission rate, and netting or offsets as applicable. One additional extension of up to 18 months may be granted if the permit holder demonstrates that emissions from the facility will comply with all rules and regulations of the commission, the intent of the Texas Clean Air Act (TCAA), including protection of the public's health and physical property; and (b)(1)the permit holder is a party to litigation not of the permit holder's initiation regarding the issuance of the permit; or (b)(2) the permit holder has spent, or committed to spend, at least 10 percent of the estimated total cost of the project up to a maximum of $5 million. A permit holder granted an extension under subsection (b)(1) of this section may receive one subsequent extension if the permit holder meets the conditions of subsection (b)(2) of this section. [30 TAC § 116.120]
3. **Construction Progress**. Start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office of the commission not later than 15 working days after occurrence of the event. [30 TAC § 116.115(b)(2)(A)]
4. **Start-up Notification**. The appropriate air program regional office shall be notified prior to the commencement of operations of the facilities authorized by the permit in such a manner that a representative of the commission may be present. The permit holder shall provide a separate notification for the commencement of operations for each unit of phased construction, which may involve a series of units commencing operations at different times. Prior to operation of the facilities authorized by the permit, the permit holder shall identify the source or sources of allowances to be utilized for compliance with Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program). [30 TAC § 116.115(b)(2)(B)]
5. **Sampling Requirements**. If sampling is required, the permit holder shall contact the commission's Office of Compliance and Enforcement prior to sampling to obtain the proper data forms and procedures. All sampling and testing procedures must be approved by the executive director and coordinated with the regional representatives of the commission. The permit holder is also responsible for providing sampling facilities and conducting the sampling operations or contracting with an independent sampling consultant. [30 TAC § 116.115(b)(2)(C)]
6. **Equivalency of Methods.** The permit holder must demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the permit. Alternative methods shall be applied for in writing and must be reviewed and approved by the executive director prior to their use in fulfilling any requirements of the permit. [30 TAC § 116.115(b)(2)(D)]
7. **Recordkeeping.** The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and

operating hours; keep all required records in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application; make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction in a timely manner; comply with any additional recordkeeping requirements specified in special conditions in the permit; and retain information in the file for at least two years following the date that the information or data is obtained. [30 TAC § 116.115(b)(2)(E)]

8. **Maximum Allowable Emission Rates**. The total emissions of air contaminants from any of the sources of emissions must not exceed the values stated on the table attached to the permit entitled "Emission Sources--Maximum Allowable Emission Rates." [30 TAC § 116.115(b)(2)(F)] [1]
9. **Maintenance of Emission Control**. The permitted facilities shall not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations. The permit holder shall provide notification in accordance with 30 TAC §101.201, 101.211, and 101.221 of this title (relating to Emissions Event Reporting and Recordkeeping Requirements; Scheduled Maintenance, Startup, and Shutdown Reporting and Recordkeeping Requirements; and Operational Requirements). [30 TAC§ 116.115(b)(2)(G)]
10. **Compliance with Rules**. Acceptance of a permit by an applicant constitutes an acknowledgment and agreement that the permit holder will comply with all rules and orders of the commission issued in conformity with the TCAA and the conditions precedent to the granting of the permit. If more than one state or federal rule or regulation or permit condition is applicable, the most stringent limit or condition shall govern and be the standard by which compliance shall be demonstrated. Acceptance includes consent to the entrance of commission employees and agents into the permitted premises at reasonable times to investigate conditions relating to the emission or concentration of air contaminants, including compliance with the permit. [30 TAC § 116.115(b)(2)(H)]
11. **This** permit may not be transferred, assigned, or conveyed by the holder except as provided by rule. [30 TAC § 116.110(e)]
12. **There** may be additional special conditions attached to a permit upon issuance or modification of the permit. Such conditions in a permit may be more restrictive than the requirements of Title 30 of the Texas Administrative Code. [30 TAC § 116.115(c)]
13. **Emissions** from this facility must not cause or contribute to "air pollution" as defined in Texas Health and Safety Code (THSC) §382.003(3) or violate THSC § 382.085. If the executive director determines that such a condition or violation occurs, the holder shall implement additional abatement measures as necessary to control or prevent the condition or violation.
14. **The** permit holder shall comply with all the requirements of this permit. Emissions that exceed the limits of this permit are not authorized and are violations of this permit. [1]

[1] Please be advised that the requirements of this provision of the general conditions may not be applicable to greenhouse gas emissions.

Common Acronyms in Air Permits

°C = Temperature in degrees Celsius
°F = Temperature in degrees Fahrenheit
°K = Temperature in degrees Kelvin
µg = microgram
µg/m^3 = microgram per cubic meter
acfm = actual cubic feet per minute
AMOC = alternate means of control
AOS = alternative operating scenario
AP-42 = Air Pollutant Emission Factors, 5th edition
APD = Air Permits Division
API = American Petroleum Institute
APWL = air pollutant watch list
BPA = Beaumont/ Port Arthur
BACT = best available control technology
BAE = baseline actual emissions
bbl = barrel
bbl/day = barrel per day
bhp = brake horsepower
BMP = best management practices
Btu = British thermal unit
Btu/scf = British thermal unit per standard cubic foot or feet
CAA = Clean Air Act
CAM = compliance-assurance monitoring
CEMS = continuous emissions monitoring systems
cfm = cubic feet (per) minute
CFR = Code of Federal Regulations
CN = customer ID number
CNG = compressed natural gas
CO = carbon monoxide
COMS = continuous opacity monitoring system
CPMS = continuous parametric monitoring system
DFW = Dallas/ Fort Worth (Metroplex)
DE = destruction efficiency
DRE = destruction and removal efficiency
dscf = dry standard cubic foot or feet
dscfm = dry standard cubic foot or feet per minute
ED = (TCEQ) Executive Director
EF = emissions factor
EFR = external floating roof tank
EGU = electric generating unit
EI = Emissions Inventory
ELP = El Paso
EPA = (United States) Environmental Protection Agency
EPN = emission point number
ESL = effects screening level
ESP = electrostatic precipitator
FCAA = Federal Clean Air Act
FCCU = fluid catalytic cracking unit
FID = flame ionization detector
FIN = facility identification number
ft = foot or feet
ft/sec = foot or feet per second
g = gram
gal/wk = gallon per week
gal/yr = gallon per year
GLC = ground level concentration
GLC_{max} = maximum (predicted) ground-level concentration
gpm = gallon per minute
gr/1000scf = grain per 1000 standard cubic feet
gr/dscf = grain per dry standard cubic feet
H_2CO = formaldehyde
H_2S = hydrogen sulfide
H_2SO_4 = sulfuric acid
HAP = hazardous air pollutant as listed in § 112(b) of the Federal Clean Air Act or Title 40 Code of Federal Regulations Part 63, Subpart C
HC = hydrocarbons
HCl = hydrochloric acid, hydrogen chloride
Hg = mercury
HGB = Houston/Galveston/Brazoria
hp = horsepower
hr = hour
IFR = internal floating roof tank
in H_2O = inches of water
in Hg = inches of mercury
IR = infrared
ISC3 = Industrial Source Complex, a dispersion model
ISCST3 = Industrial Source Complex Short-Term, a dispersion model
K = Kelvin; extension of the degree Celsius scaled-down to absolute zero
LACT = lease automatic custody transfer
LAER = lowest achievable emission rate
lb = pound
hp = horsepower
hr = hour lb/day = pound per day
lb/hr = pound per hour
lb/MMBtu = pound per million British thermal units
LDAR = Leak Detection and Repair (Requirements)
LNG = liquefied natural gas
LPG = liquefied petroleum gas
LT/D = long ton per day
m = meter
m^3 = cubic meter
m/sec = meters per second
MACT = maximum achievable control technology
MAERT = Maximum Allowable Emission Rate Table
MERA = Modeling and Effects Review Applicability
mg = milligram
mg/g = milligram per gram
mL = milliliter
MMBtu = million British thermal units
MMBtu/hr = million British thermal units per hour
MSDS = material safety data sheet
MSS = maintenance, startup, and shutdown
MW = megawatt
NAAQS = National Ambient Air Quality Standards
NESHAP = National Emission Standards for Hazardous Air Pollutants
NGL = natural gas liquids
NNSR = nonattainment new source review
NO_x = total oxides of nitrogen

NSPS = New Source Performance Standards
PAL = plant-wide applicability limit
PBR = Permit(s) by Rule
PCP = pollution control project
PEMS = predictive emission monitoring system
PID = photo ionization detector
PM = periodic monitoring
PM = total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented
$PM_{2.5}$ = particulate matter equal to or less than 2.5 microns in diameter
PM_{10} = total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$, as represented
POC = products of combustion
ppb = parts per billion
ppm = parts per million
ppmv = parts per million (by) volume
psia = pounds (per) square inch, absolute
psig = pounds (per) square inch, gage
PTE = potential to emit
RA = relative accuracy
RATA = relative accuracy test audit
RM = reference method
RVP = Reid vapor pressure
scf = standard cubic foot or feet
scfm = standard cubic foot or feet (per) minute
SCR = selective catalytic reduction
SIL = significant impact levels
SNCR = selective non-catalytic reduction
SO_2 = sulfur dioxide
SOCMI = synthetic organic chemical manufacturing industry
SRU = sulfur recovery unit
TAC = Texas Administrative Code
TCAA = Texas Clean Air Act
TCEQ = Texas Commission on Environmental Quality
TD = Toxicology Division
TLV = threshold limit value
TMDL = total maximum daily load
tpd = tons per day
tpy = tons per year
TVP = true vapor pressure
VOC = volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
VRU = vapor recovery unit or system

Special Conditions

Permit Number 122362 and PSDTX1430M1

1. This permit covers only those sources of emissions listed in the attached table entitled “Emission Sources - Maximum Allowable Emission Rates” (MAERT), and those sources are limited to the emission limits and other conditions specified in that table.

2. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases containing volatile organic compounds (VOC) at a concentration of greater than 1 weight percent are not authorized by this permit unless authorized on the MAERT. Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions.

Federal Applicability

3. These facilities shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources promulgated in Title 40 Code of Federal Regulations Part 60 (40 CFR Part 60): **(08/18)**

   A. Subpart A, General Provisions.

   B. Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

4. These facilities shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on National Emission Standards for Hazardous Air Pollutants for Source Categories in 40 CFR Part 63: **(08/18)**

   A. Subpart A, General Provisions.

   B. Subpart Y, National Emission Standards for Marine Tank Vessel Loading Operations

   C. Subpart EEEE, National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline).

5. If any condition of this permit is more stringent than the applicable regulations in Special Condition Nos. 3 and 4, then for the purposes of complying with this permit, the permit shall govern and be the standard by which compliance shall be demonstrated.

Emission Standards and Operational Specifications

6. Fuel gas combusted at this facility shall be pipeline quality natural gas containing no more than 0.2 grains of total sulfur per 100 dry standard cubic feet. The natural gas shall be sampled every 6 months to determine total sulfur and net heating value. Test results from the fuel supplier may be used to satisfy this requirement. Fuel gas volume used for each combustion device shall be monitored and recorded with records being updated on a monthly basis.

7. Storage tank throughput and service shall be limited to the following: **(12/19)**

   The simultaneous loading of condensate into storage tanks are limited to 12 tanks at any given time.

Tank EPN	Service	Fill/Withdraw Rate (barrels/hr)
T-101	Crude	40,000
T-102	Crude	40,000
T-103	Crude/Crude Condensate	40,000
T-104	Crude	40,000
T-105	Crude	40,000
T-106	Crude/Crude Condensate	40,000
T-107	Crude	40,000
T-108	Crude	40,000
T-109	Crude/Crude Condensate	40,000
T-110	Crude/Crude Condensate	40,000
T-111	Crude/Crude Condensate	40,000
T-112	Crude/Crude Condensate	40,000
T-113	Crude/Crude Condensate	40,000
T-114	Crude/Crude Condensate	40,000
T-115	Crude/Crude Condensate	40,000
T-116	Crude/Crude Condensate	40,000
T-117	Crude/Crude Condensate	40,000
T-118	Crude/Crude Condensate	40,000
T-119	Crude/Crude Condensate	40,000
T-120	Crude/Crude Condensate	40,000
T-121	Crude/Crude Condensate	40,000
T-122	Crude/Crude Condensate	40,000
T-123	Crude/Crude Condensate	40,000
T-124	Crude/Crude Condensate	40,000
T-125	Crude/Crude Condensate	40,000
T-126	Crude/Crude Condensate	40,000
T-127	Crude/Crude Condensate	40,000
T-128	Crude/Crude Condensate	40,000
T-129	Crude/Crude Condensate	40,000
T-130	Crude/Crude Condensate	40,000
T-131	Crude/Crude Condensate	40,000
T-132	Crude/Crude Condensate	40,000
T-133	Crude/Crude Condensate	40,000
T-134	Crude/Crude Condensate	40,000
T-135	Crude/Crude Condensate	40,000
T-136	Crude/Crude Condensate	40,000
T-137	Crude/Crude Condensate	40,000
T-138	Crude/Crude Condensate	40,000
T-139	Crude/Crude Condensate	40,000
T-140	Crude/Crude Condensate	40,000
T-141	Crude/Crude Condensate	40,000

Tank EPN	Service	Fill/Withdraw Rate (barrels/hr)
T-142	Crude/Crude Condensate	40,000
T-143	Crude/Crude Condensate	40,000
T-144	Crude/Crude Condensate	40,000
T-201	Crude	1,000
T-202	Crude	1,000
EMERTK1	Crude/Crude Condensate	12,600
EMERTK2	Crude/Crude Condensate	12,600

8. Storage tanks are subject to the following requirements: The control requirements specified in parts A-C of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95°F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons.

   A. The tank emissions must be controlled as specified in one of the paragraphs below:

      (1) An internal floating deck or “roof” shall be installed. A domed external floating roof tank is equivalent to an internal floating roof tank. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.

      (2) An open-top tank shall contain a floating roof (external floating roof tank) which uses double seal or secondary seal technology provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.

   B. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and any seal gap measurements specified in Title 40 Code of Federal Regulations § 60.113b (40 CFR § 60.113b) Testing and Procedures (as amended at 54 FR 32973, Aug. 11, 1989) to verify fitting and seal integrity. Records shall be maintained of the dates inspection was performed, any measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.

   C. The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998 except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.

   D. Except for labels, logos, etc. not to exceed 15 percent of the tank total surface area, uninsulated tank exterior surfaces exposed to the sun shall be white or unpainted aluminum. Storage tanks must be equipped with permanent submerged fill pipes.

9. Each tank shall be designed to completely drain its entire contents to a sump in a manner that leaves no more than 8 gallons of free-standing liquid in the tank sump.

10. The holder of this permit shall reduce the temperature and/or vapor pressure of the stored material as needed to maintain a true vapor pressure of less than 11.0 psia at actual storage conditions in each storage tank. Storage of any product with a true vapor pressure of 11.0 psi or greater at ambient conditions is not authorized by this permit.

11. The permit holder shall determine the dissolved H_2S concentration of each crude oil stock to be stored using ASTM D7621 or UOP163, or additional method approved by TCEQ.

    A. The dissolved hydrogen sulfide in the crude oil shall not exceed 10 parts per million by weight (ppmw) in any sample. **(12/19)**

    B. The frequency of sampling shall be the more frequent of:

        (1) quarterly; or

        (2) within 60 days of any crude oil stock change of service.

12. The permit holder shall maintain an emissions record which includes calculated emissions of VOC and H_2S from all storage tanks during the previous calendar month and the past consecutive 12-month period. The record shall include tank identification number, control method used, tank capacity in gallons, name of the material stored, VOC molecular weight, liquid monthly average temperature in degrees Fahrenheit, VOC and H_2S vapor pressure at the monthly average material temperature in psia, liquid throughput for the previous month and year-to-date. Records of monthly average liquid temperature are not required to be kept for unheated tanks which receive liquids that are at or below ambient temperatures.

    Emissions from tanks shall be calculated using the methods that were used to determine the MAERT limits in the permit application, August 1, 2014. Sample calculations from the application shall be attached to a copy of this permit at the plant site.

Marine Loading

13. The marine (barge and ship) loading is limited to a yearly throughput of 689,580,000 barrels. **(12/19)**

14. The loading of barges and ships is limited to loading crude oil and crude condensate. All vapors generated from marine loading shall be routed to the marine loading vapor control system (Vapor Combustor EPNs VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, or VCU-7).

    The maximum hourly loading rate at any time shall not exceed a combined loading rate listed on page 3 of the confidential portion of the permit amendment application submittal dated April 20, 2018. **(08/18)**

15. All loading lines (hoses) and connectors shall be visually inspected for any defects prior to hookup. Lines and connectors that are visibly damaged shall be removed from service. Operations shall cease immediately upon detection of any liquid leaking from the lines or connections. Flanged connections shall be used for all loading operations. The following actions shall be taken prior to removing loading lines/hoses from marine vessels and shore facilities.

    A. After the transfer is complete, the loading line/hose shall be isolated at the connection to the shore piping. The loading line/hose shall be vented at the shore piping and shall be gravity drained into the marine vessel per the site operating procedure.

B. The loading line/hose may be disconnected from the shore and/or marine vessel piping after the liquid has been removed to the extent possible by gravity draining to the vessel being loaded. If it is necessary to further empty the line/hose, any residual liquid in the line/hose shall be immediately drained directly into a covered sump. If the line/hose is not emptied, the open end(s) of the line/hose shall be immediately capped, plugged, or blinded to prevent leakage.

C. After the loading line/hose has been removed from the vessel, the vapor return line shall be immediately isolated.

The actions shall be documented as part of the loading procedure.

16. Marine vessels shall not be loaded unless the vapor collection system is properly connected, and the entire collection and destruction system is working as designed.

17. Unless the vessel must be inerted during loading due to safety requirements, all vapors associated with marine loading shall be routed through a vacuum-assisted collection system as specified below

A. the marine loading vapor collection system shall be operated such that the vacuum maintained in the collection system during loading is no less than one inch of water and that the vessel being loaded is also under a vacuum.

B. The vacuum monitor shall be installed, calibrated at least annually, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of ±5 percent of the vacuum being measured or ±0.15 inches of water.

C. A pressure measurement device shall be installed as close as possible to the vessel’s vapor return port to continuously monitor and record the vacuum while loading is taking place. The collection system vacuum shall be continuously monitored and recorded at least once every 6 minutes while loading is occurring. The monitoring device shall be accurate to, and shall be calibrated at least annually in accordance with, the manufacturer’s specifications.

D. Quality-assured (or valid) data must be generated when loading is occurring. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that barge loading is occurring over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded.

18. VOC collection efficiency tests of inerted ocean-going marine vessels designated as very large crude carriers (VLCCs) shall be conducted as follows to demonstrate a collection efficiency of 99.9% as represented in the permit application. **(12/19)**

A. Testing shall be conducted using the protocol agreed to by the Executive Director on June 22, 2015. Any revision to the approved testing protocol shall require approval from the Executive Director prior to implementation. The permittee shall maintain a copy of the approved protocol on site.

B. Complying test results shall be obtained in accordance with the protocol for a minimum of one vessel. The test shall be conducted within twelve months of the first loading of an inerted ocean-going marine vessel.

C. The results of the test shall be submitted to the TCEQ Regional Office with a copy to the TCEQ Air Permits Division within 60 days after completion of the test.

D. The TCEQ Regional Office must be notified at least 48 hours prior to testing. The facility owner or operator may request a waiver from the 48 hour advance notification requirement from the TCEQ Regional Office.

E. The permit holder shall maintain the following records for each ship tested for a period of 5 years from the date of testing:

(1) The most recent vapor tightness certificate;

(2) A recent, completed Standard Tanker Chartering Questionnaire form (Q88); and

(3) Records of each incidence of testing conducted in accordance with this condition.

19. The following additional requirements apply to loading of a VOC which has a vapor pressure equal to or greater than 0.5 pounds per square inch absolute (psia) under actual storage conditions onto inerted marine vessels (ships and ocean-going barges). **(12/19)**

A. Before loading, the owner or operator of the marine terminal shall verify that the marine vessel has passed an annual vapor tightness test as specified in 40 CFR §63.565(c) (September 19, 1995) or 40 CFR §61.304(f) (October 17, 2000) within the previous twelve months, and received a recent, completed Standard Tanker Chartering Questionnaire form (Q88) or equivalent.

B. The pressure at the vapor collection connection of an inerted marine vessel must be maintained such that the pressure in a vessel's cargo tanks do not go below 0.2 pounds per square inch gauge (psig) or exceed 80% of the lowest setting of any of the vessel's pressure relief valves. The lowest vessel cargo tank or vent header pressure relief valve setting for the vessel being loaded shall be recorded. Pressure shall be continuously monitored while the vessel is being loaded. Pressure shall be recorded at fifteen-minute intervals.

C. VOC loading rates shall be recorded during loading. The loading rate must not exceed the maximum permitted loading rate.

D. During loading, the owner or operator of the marine terminal or of the marine vessel shall conduct audio, olfactory, and visual checks for leaks within the first hour of loading and once every 8 hours thereafter for on-shore equipment and on board the ship.

(1) If a liquid leak is detected during loading and cannot be repaired immediately (for example, by tightening a bolt or packing gland), then the loading operation shall cease until the leak is repaired.

(2) If a vapor leak is detected by sight, sound, smell, or hydrocarbon gas analyzer during the loading operation, then a "first attempt" shall be made to repair the leak. Loading operations need not be ceased if the first attempt to repair the leak is not successful provided that the first attempt effort is documented by the owner or operator of the marine vessel and a copy of the repair log is made available to a representative of the marine terminal.

(3) If the attempt to repair the leak is not successful and loading continues, emissions from the loading operation for that ship shall be calculated assuming a collection efficiency of 99%.

Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained at the plant site of all repairs and replacements made due to leaks. These records shall be made available to representatives of the TCEQ upon request.

20. Reserved

21. The following conditions apply to loading tank trucks with crude oil or crude condensate.

A. Loading of tank trucks with crude oil and crude condensate is limited to a maximum combined loading rate of 300 barrels per hour.

B. All lines and connectors shall be visually inspected for any defects prior to hookup. Lines and connectors that are visibly damaged shall be removed from service. Operations shall cease immediately upon detection of any liquid leaking from the lines or connections.

C. Loading emissions shall be vented to a vapor combustor (EPN VCU-4). The vapor combustor shall achieve a minimum of 99.9% control of the waste gas directed to it. **(12/18)**

D. Each tank truck shall pass vapor-tight testing every 12 months using the methods described in Title 40 Code of Federal Regulations Part 63 (40 CFR 63), Subpart R. The permit holder shall not allow a tank truck to be filled unless it has passed a leak-tight test within the past year as evidenced by a certificate which shows the date the tank truck last passed the leak-tight test required by this condition and the identification number of the tank truck.

22. All loading shall be submerged.

23. The permit holder shall maintain and update monthly an emissions record which includes calculated emissions of VOC from all loading operations over the previous rolling 12-month period. The record shall include the loading spot, control method used, quantity loaded in gallons, name of the liquid loaded, vapor molecular weight, liquid temperature in degrees Fahrenheit, liquid vapor pressure at the liquid temperature in psia, liquid throughput for the previous month and rolling 12 months to date. Records of VOC temperature are not required to be kept for liquids loaded from unheated tanks which receive liquids that are at or below ambient temperatures. Loading emissions shall be calculated using the methods used to determine the MAERT limits in the permit application for the facilities authorized by this permit. Sample calculations from the application shall be attached to a copy of the permit at the terminal.

Tank Roof Landings

24. This permit authorizes emissions from tank roof landings due to inventory control, changes in tank service or tank inspection/maintenance as identified in the permit application. Tank roof landings include all operations when the tank floating roof is on its supporting legs. These emissions are subject to the maximum allowable emission rates indicated on the MAERT. The following requirements apply to tank roof landings.

A. If the tank is to be completely drained, the tank liquid level shall be continuously lowered after the tank floating roof initially lands on its supporting legs until the tank and tank sump have been drained to the maximum extent practicable without entering the tank.

B. A vapor recovery system shall be connected to the vapor space under the landed tank roof and the vapor space vented to the tank roof landing vapor combustor (EPN VCU-4). The locations and identifiers of vents other than permanent roof fittings and seals, control device or controlled recovery system, and controlled exhaust stream shall be recorded. There shall be no other gas/vapor flow out of the vapor space under the floating roof when the vapor space is directed to the control device. The vapor space shall be vented to the control device during the period from the first stoppage of liquid withdrawal after the roof is landed until the VOC concentration in the tank per part E of this condition has been verified or the tank has been filled so that the landed roof is floating on the liquid. The vapor recovery system collection rate shall always be greater than 100 cubic feet per minute when the tank is idle and two times the fill rate when the tank is being refilled.

C. The tank roof shall be landed on its lowest legs unless tank entry is planned. The time the roof is landed shall be minimized unless the tank has been completely drained and degassed.

D. If the tank is not degassed per part E of this condition, the date and time the roof is again floating on liquid shall be recorded and parts E through G of this condition do not apply.

E. Tanks shall be degassed as follows:

(1) If tank entry is planned or the tank is to be removed from service for an extended period and the tank had not been entered within the last 24 months, the permit holder shall open at least one entry into the tank to perform a visual inspection of the tank floor and sump to confirm that there is no standing liquid present and the drain dry tank is operating as designed. This inspection shall be performed during controlled degassing, if applicable. If any standing liquid is noted, it must be removed prior to uncontrolled tank degassing.

(2) The gas or vapor removed from the vapor space under the floating roof must be routed to a control device through a controlled recovery system and controlled degassing must be maintained until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. The locations and identifiers of vents other than permanent roof fittings and seals, control device or controlled recovery system, and controlled exhaust stream shall be recorded. There shall be no other gas/vapor flow out of the vapor space under the floating roof when degassing to the control device.

(3) The vapor space under the floating roof shall be vented using good engineering practice to ensure air contaminants are flushed out of the tank through the control device or controlled recovery system to the extent allowed by the storage tank design.

(4) A volume of purge gas equivalent to twice the volume of the vapor space under the floating roof must have passed through the control device before the vent stream may be sampled to verify acceptable VOC concentration. The measurement of purge gas volume shall not include any make-up air introduced into the control device or recovery system.

(5) The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged.

F. The vapor space under the floating roof shall be vented using good engineering practice to ensure air contaminants are flushed out of the tank through the control device or controlled recovery system to the extent allowed by the storage tank design.

G. The tank may be opened without restriction and ventilated without control after all standing liquid has been removed from the tank as verified by visible inspection and the vapor space concentration in the tank has been verified to be less than 10,000 ppmv or 10% of the LEL. The VOC sampling and analysis shall be performed as specified in Special Condition No 33.A or 33.C.

H. During refilling, the vapor space below the tank roof shall be directed to the vapor combustor until the roof is floating on the liquid. The method and locations used to connect the control device shall be recorded. All vents from the tank being filled must exit through the vapor combustor.

I. Two routine tank roof landings, two MSS tank roof landings, or one routine tank roof landing and one MSS tank roof landing may occur simultaneously. Only one tank with a landed floating roof can be filled at any time at a rate not to exceed 5,000 bbl/hr until the roof is refloated. **(12/19)**

J. The occurrence of each roof landing and the associated emissions shall be recorded, and the rolling 12-month tank roof landing emissions shall be updated on a monthly basis. These records shall include at least the following information:

(1) the identification of the tank and emission point number, and any control devices or recovery systems used to reduce emissions;

(2) the reason for the tank roof landing;

(3) for the purposes of estimating emissions, the date, time, and other information specified for each of the following events:

a. the roof was initially landed,
b. all liquid was pumped from the tank to the extent practical,
c. start and completion of controlled standing idle emissions, vapor space volume under the floating roof vented to control device and ventilation flow rate to the control device
d. start and completion of controlled degassing, total volumetric flow, results of any tank inspection of the tank for liquid and any corrective actions taken, VOC concentration sampling results,
e. all standing liquid was removed from the tank,
f. VOC concentration sampling results,
g. refilling commenced, liquid filling the tank, and the volume necessary to float the roof; and
h. tank roof off supporting legs, floating on liquid.

(4) the estimated quantity of each air contaminant, or mixture of air contaminants, emitted between events c and g with the data and methods used to determine it. The emissions associated with roof landing activities shall be calculated using the methods described in Section 7.1.3.2 of AP-42 "Compilation of Air Pollution Emission Factors, Chapter 7 - Storage of Organic Liquids" dated November 2006 and the permit application.

K. Floating roof landings with associated degassing are limited to 12 events per tank per rolling 12-month period. **(12/18)**

Piping, Valves, Connectors, Pumps, Agitators, and Compressors - 28VHP (Revised 5/17/11)

25. Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment:

A. The requirements of paragraphs F and G shall not apply (1) where the Volatile Organic Compound (VOC) has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

(1) piping and instrumentation diagram (PID);

(2) a written or electronic database or electronic file;

(3) color coding;

(4) a form of weatherproof identification; or

(5) designation of exempted process unit boundaries.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;

(1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or

(2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

G. Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days and a record of the attempt shall be maintained.

I. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings recorded. Records of physical inspections shall be noted in the operator’s log or equivalent.

K. Alternative monitoring frequency schedules of 30 TAC §§ 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.

Vapor Combustors

26. The vapor combustors (EPNs: VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, and VCU-7) shall achieve 99.9 percent control of the carbon compounds directed to it during loading. Vapor combustor VCU-4 shall achieve 99.9 percent control of the carbon compounds directed to it during tank truck loading, tank roof landings due to inventory control or changes in tank service, and storage tank MSS activities. The permit holder shall operate the VCUs in the following manner: **(11/20)**

A. For VCU-1, VCU-2, VCU-3, and VCU-4, control efficiency shall be ensured by maintaining the six-minute average temperature in the combustion chamber during marine loading, tank truck loading, tank roof landings due to inventory control or changes in tank service, and storage tank MSS activities above the values demonstrated by initial stack testing as specified below:

Unit	Minimum Six-Minute Average Temperature (°F)	Initial Stack Test Date
VCU-1	1499	April 7, 2017
VCU-2	1479	April 26, 2017
VCU-3	1500	April 7, 2017
VCU-4	1461	January 26, 2017

Should future stack testing be conducted in accordance with Special Condition 27, the six-minute average temperature shall be maintained during marine loading, tank truck loading, tank roof landings due to inventory control or changes in tank service, and storage tank MSS activities above the minimum one-hour average temperature maintained during the last satisfactory stack test.

B. For VCU-5, VCU-6, and VCU-7, control efficiency shall be ensured by maintaining the temperature in the combustion chamber above 1500°F during marine loading prior to the initial stack test performed in accordance with Special Condition 27. Following the completion of that stack test, the six-minute average temperature shall be maintained above the minimum one-hour average temperature maintained during the last satisfactory stack test.

C. The temperature measurement device shall reduce the temperature readings to an averaging period of 6 minutes or less and record it at that frequency. The temperature monitor shall be installed, calibrated at least annually, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of ±2 percent of the temperature being measured expressed in degrees Fahrenheit or ±4.5ºF.

D. Quality assured (or valid) data must be generated when the VCU is operating. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the VCU operated over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded.

E. Each vapor combustor shall be operated with no visible emissions and have a constant pilot flame during all times waste gas could be directed to it. The pilot flame shall be continuously monitored by a thermocouple or an infrared monitor. The time, date, and duration of any loss of pilot flame shall be recorded. Each monitoring device shall be accurate to, and shall be calibrated at a frequency in accordance with, the manufacturer’s specifications.

27. The permit holder shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from vapor combustor EPNs: VCU-1, VCU-2, VCU-3, VCU-4, VCU-5, VCU-6, and VCU-7 to demonstrate compliance with the MAERT. Initial stack sampling per the requirements of this condition was performed for VCU-1, VCU-2, VCU-3, and VCU-4 as noted in Special Condition 26.A. The permit holder is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense. Sampling shall be conducted in accordance with the appropriate procedures of the Texas Commission on Environmental Quality (TCEQ) Sampling Procedures Manual and the U.S. Environmental Protection Agency (EPA) Reference Methods. **(08/18)**

Requests to waive testing for any pollutant specified in this condition shall be submitted to the TCEQ Office of Air, Air Permits Division. Test waivers and alternate/equivalent procedure proposals for Title 40 Code of Federal Regulation Part 60 (40 CFR Part 60) testing which must have EPA approval shall be submitted to the TCEQ Regional Director.

A. The appropriate TCEQ Regional Office shall be notified not less than 45 days prior to sampling. The notice shall include:

(1) Proposed date for pretest meeting.

(2) Date sampling will occur.

(3) Name of firm conducting sampling.

(4) Type of sampling equipment to be used.

(5) Method or procedure to be used in sampling.

(6) Description of any proposed deviation from the sampling procedures specified in this permit or TCEQ/EPA sampling procedures.

(7) Procedure/parameters to be used to determine worst case emissions.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for the test reports. The TCEQ Regional Director must approve any deviation from specified sampling procedures.

B. Air contaminants emitted from the vapor combustors to be tested for include (but are not limited to) VOC, NOx, and CO.

C. Sampling shall occur within 60 days after achieving the maximum operating rate, but no later than 180 days after initial start-up of the facilities (or increase in production, as appropriate) and at such other times (identify the need for any periodic sampling here) as may be required by the TCEQ Executive Director. Requests for additional time to perform sampling shall be submitted to the appropriate regional office.

D. Each vapor combustor shall be sampled under the following conditions during stack emission testing: **(08/18)**

(1) For EPNs VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, and VCU-7, each vapor combustor shall be sampled while loading marine vessels at the maximum loading rate.

(2) EPN VCU-4: the vapor combustor shall be sampled while refloating the tank roof of an uncleaned tank (heel present) that has been emptied to the maximum extent possible while filling at the maximum fill rate. These conditions/parameters and any other primary operating parameters that affect the emission rate shall be monitored and recorded during the stack test. Any additional parameters shall be determined at the pretest meeting and shall be stated in the sampling report. Permit conditions and parameter limits may be waived during stack testing performed under this condition if the proposed condition/parameter range is identified in the test notice specified in paragraph A and accepted by the TCEQ Regional Office. Permit allowable emissions and emission control requirements are not waived and still apply during stack testing periods.

(3) During subsequent operations, if the loading rate is greater than that recorded during the test period, stack sampling shall be performed at the new operating conditions within 120 days. This sampling may be waived by the TCEQ Air Section Manager for the region.

E. Copies of the final sampling report shall be forwarded to the offices below within 60 days after sampling is completed. Sampling reports shall comply with the attached provisions entitled “Chapter 14, Contents of Sampling Reports” of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

One copy to the appropriate TCEQ Regional Office.

One copy to each local air pollution control program.

F. Sampling ports and platform(s) shall be incorporated into the design of (source stack and EPN) according to the specifications set forth in the attachment entitled “Chapter 2, Stack Sampling Facilities” of the Texas Commission on Environmental Quality (TCEQ) Sampling Procedures Manual. Alternate sampling facility designs must be submitted for approval to the TCEQ Regional Director

Continuous Demonstration of Compliance

28. The following requirements apply to capture systems for vapor combustors (EPNs VCU-1, VCU-2, VCU-3, VCU-4, VCU-5, VCU-6, and VCU-7). **(08/18)**

A. The permit holder shall perform one of the following:

(1) Conduct a once a month visual, audible, and/or olfactory inspection of the capture system to verify there are no leaking components in the capture system; or

(2) Once a year, verify the capture system is leak-free by inspecting in accordance with 40 CFR Part 60, Appendix A, Test Method 21. Leaks shall be indicated by an instrument reading greater than or equal to 500 ppmv above background.

B. The control device shall not have a bypass, or if there is a bypass for the control device, comply with either of the following requirements:

(1) Install a flow indicator that records and verifies zero flow at least once every fifteen minutes immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere; or

(2) Once a month, inspect the valves, verifying that the position of the valves and the condition of the car seals prevent flow out the bypass.

A bypass does not include authorized analyzer vents, highpoint bleeder vents, low point drains, or rupture discs upstream of pressure relief valves if the pressure between the disc and relief valve is monitored and recorded at least weekly. A deviation shall be reported if the monitoring or inspections indicate bypass of the control device when it is required to be in service.

C. Records of the inspections required shall be maintained and if the results of any of the above inspections are not satisfactory, the permit holder shall promptly take necessary corrective action.

Planned Maintenance, Startup and Shutdown

29. This permit authorizes the emissions from the facilities authorized by this permit for the planned maintenance, startup, and shutdown (MSS) activities summarized in this condition. **(11/20)**

A. MSS Activity Summary

Facility	Activity	EPN
Storage Tanks	Controlled Tank Roof landings (Standing idle and refilling)	MSS-CONT
Storage Tanks	Controlled Tank Degassing	MSS-CONT
Storage Tanks	Tank opening, uncontrolled venting to atmosphere	MSS-ATM
Routine Maintenance Activities (Paragraph B)	Drain	MSS-ATM

Facility	Activity	EPN
Routine Maintenance Activities (Paragraph B)	Degas to control	MSS-CONT
Routine Maintenance Activities (Paragraph B)	Opening, uncontrolled venting to atmosphere.	MSS-ATM
Routine Maintenance Activities (Paragraph B)	Controlled refilling	MSS-CONT
Minor facilities meeting criteria of Special Condition 29.E; pumps, valves, piping, filters, etc. with an isolated volume of less than 85 cubic feet (i.e. 50 lbs of air contaminant)	Isolate, drain, degas to atmosphere, and refill to support planned maintenance	MSS-ATM
Air movers and vacuum trucks	Drain liquid from tanks for planned maintenance	MSS-CONT
Frac Tanks, temporary tanks and vessels	Temporary Storage	MSS-ATM
Equipment resurfacing	MSS Abrasive Blasting	BLAST
Loading of abrasive materials into abrasive blasting hopper	MSS Hopper Loading	HOPPER
Loading of blast pot used for abrasive blasting	MSS Blast Pot Loading	BLASTLOAD
Loading of containers with spent blast materials	MSS Roll-off Box Loading	ROLLOFF

B. Routine Maintenance Activities

(1) Pump repair/replacement

(2) Fugitive component (valve, pipe, flange) repair/replacement

(3) Filter and meter repair/replacement

(4) Compressor repair/replacement

30. This permit authorizes emissions from the following temporary facilities used to support planned MSS activities at permanent site facilities: frac tanks, containers, vacuum trucks, portable control devices identified in Special Condition 41 and controlled recovery systems. Emissions from temporary facilities are authorized provided the temporary facility (a) does not remain on the plant site for more than 12 consecutive months, (b) is used solely to support planned MSS activities at the permanent site facilities listed in this Attachment, and (c) does not operate as a replacement for an existing authorized facility.

31. Routine maintenance activities, as identified in Special Condition 29.B may be tracked through the work orders or equivalent. Emissions from activities identified in Special Condition 29.B shall be calculated using the number of work orders or equivalent that month and the emissions associated with that activity identified in the permit application.

The performance of each planned MSS activity not identified in Special Condition 29.B and the emissions associated with it shall be recorded and include at least the following information:

A. the process unit at which emissions from the MSS activity occurred, including the emission point number and common name of the process unit;

B. the type of planned MSS activity and the reason for the planned activity;

C. the common name and the facility identification number, if applicable, of the facilities at which the MSS activity and emissions occurred;

D. the date and time of the MSS activity and its duration;

E. the estimated quantity of each air contaminant, or mixture of air contaminants, emitted with the data and methods used to determine it. The emissions shall be estimated using the methods identified in the permit application, consistent with good engineering practice.

All MSS emissions shall be summed monthly and the rolling 12-month emissions shall be updated on a monthly basis.

32. Process units and facilities, with the exception of those identified in Special Conditions 24 and 36 shall be depressurized, emptied, degassed, and placed in service in accordance with the following requirements.

A. The process equipment shall be depressurized to a control device or a controlled recovery system prior to venting to atmosphere, degassing, or draining liquid. Equipment that only contains material that is liquid with VOC partial pressure less than 0.50 psi at the normal process temperature and 95°F may be opened to atmosphere and drained in accordance with paragraph C of this special condition. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded

B. If mixed phase materials must be removed from process equipment, the cleared material shall be routed to a knockout drum or equivalent to allow for managed initial phase separation. If the VOC partial pressure is greater than 0.50 psi at either the normal process temperature or 95°F, any vents in the system must be routed to a control device or a controlled recovery system. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. Control must remain in place until degassing has been completed or the system is no longer vented to atmosphere

C. All liquids from process equipment or storage vessels must be removed to the maximum extent practical prior to opening equipment to commence degassing and/or maintenance. Liquids must be drained into a closed vessel or closed liquid recovery system unless prevented by the physical configuration of the equipment. If it is necessary to drain liquid into an open pan or sump, the liquid must be covered or transferred to a covered vessel within one hour of being drained

D. If the VOC partial pressure is greater than 0.50 psi at the normal process temperature or 95°F, facilities shall be degassed using good engineering practice to ensure air contaminants are removed from the system through the control device or controlled recovery system to the extent allowed by process equipment or storage vessel design. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded. The facilities to be degassed shall not be vented directly to atmosphere, except as necessary to establish isolation of the work area or to monitor VOC concentration following controlled depressurization. The venting shall be minimized to the maximum extent practicable and actions taken recorded. The control device or recovery system utilized shall be recorded with the estimated emissions from controlled and uncontrolled degassing calculated using the methods that were used to determine allowable emissions for the permit application.

(1) For MSS activities identified in Special Condition 29.B, the following option may be used in lieu of (2) below. The facilities being prepared for maintenance shall not be vented directly to atmosphere until the VOC concentration has been verified to be less than 10 percent of the lower explosive limit (LEL) per the site safety procedures

(2) The locations and/or identifiers where the purge gas or steam enters the process equipment or storage vessel and the exit points for the exhaust gases shall be recorded (process flow diagrams [PFDs] or piping and instrumentation diagrams [P&IDs] may be used to demonstrate compliance with the requirement). If the process equipment is purged with a gas, two system volumes of purge gas must have passed through the control device or controlled recovery system before the vent stream may be sampled to verify acceptable VOC concentration prior to uncontrolled venting. The VOC sampling and analysis shall be performed using an instrument meeting the requirements of Special Condition 33. The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged. If there is not a connection (such as a sample, vent, or drain valve) available from which a representative sample may be obtained, a sample may be taken upon entry into the system after degassing has been completed. The sample shall be taken from inside the vessel so as to minimize any air or dilution from the entry point. The facilities shall be degassed to a control device or controlled recovery system until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. Documented site procedures used to de-inventory equipment to a control device for safety purposes (i.e., hot work or vessel entry procedures) that achieve at least the same level of purging may be used in lieu of the above

E. Gases and vapors with VOC partial pressure greater than 0.50 psi may be vented directly to atmosphere if all the following criteria are met:

(1) It is not technically practicable to depressurize or degas, as applicable, into the process

(2) There is not an available connection to a plant control system (flare)

(3) There is no more than 50 lb of air contaminant to be vented to atmosphere during shutdown or startup, as applicable

All instances of venting directly to atmosphere per Special Condition 32.E must be documented when occurring as part of any MSS activity. The emissions associated with venting without control must be included in the work order or equivalent for those planned MSS activities identified in Special Condition 29.B

33. Air contaminant concentration shall be measured using an instrument/detector meeting one set of requirements specified below.

A. VOC concentration shall be measured using an instrument meeting all the requirements specified in EPA Method 21 (40 CFR 60, Appendix A) with the following exceptions:

(1) The instrument shall be calibrated within 24 hours of use with a calibration gas such that the response factor (RF) of the VOC (or mixture of VOCs) to be monitored shall be less than 2.0. The calibration gas and the gas to be

measured, and its approximate (RF) shall be recorded. If the RF of the VOC (or mixture of VOCs) to be monitored is greater than 2.0, the VOC concentration shall be determined as follows:

VOC Concentration = Concentration as read from the instrument*RF

In no case should a calibration gas be used such that the RF of the VOC (or mixture of VOCs) to be monitored is greater than 5.0.

(2) Sampling shall be performed as directed by this permit in lieu of section 8.3 of Method 21. During sampling, data recording shall not begin until after two times the instrument response time. The date and time shall be recorded, and VOC concentration shall be monitored for at least 5 minutes, recording VOC concentration each minute. As an alternative the VOC concentration may be monitored over a five-minute period with an instrument designed to continuously measure concentration and record the highest concentration read. The highest measured VOC concentration shall be recorded and shall not exceed the specified VOC concentration limit prior to uncontrolled venting.

B. Colorimetric gas detector tubes may be used to determine air contaminant concentrations if they are used in accordance with the following requirements

(1) The air contaminant concentration measured as defined in (3) is less than 80 percent of the range of the tube and is at least 20 percent of the maximum range of the tube

(2) The tube is used in accordance with the manufacturer's guidelines

(3) At least 2 samples taken at least 5 minutes apart must satisfy the following prior to uncontrolled venting:

measured contaminant concentration (ppmv) < release concentration.

Where the release concentration is:

10,000*mole fraction of the total air contaminants present that can be detected by the tube.

The mole fraction may be estimated based on process knowledge. The release concentration and basis for its determination shall be recorded.

Records shall be maintained of the tube type, range, measured concentrations, and time the samples were taken.

C. Lower explosive limit measured with a lower explosive limit detector

(1) The detector shall be calibrated within 30 days of use with a certified pentane gas standard at 25% of the lower explosive limit (LEL) for pentane. Records of the calibration date/time and calibration result (pass/fail) shall be maintained

(2) A functionality test shall be performed on each detector within 24 hours of use with a certified gas standard at 25% of the LEL for pentane. The LEL monitor

shall read no lower than 90% of the calibration gas certified value. Records, including the date/time and test results, shall be maintained

(3) A certified methane gas standard equivalent to 25% of the LEL for pentane may be used for calibration and functionality tests provided that the LEL response is within 95% of that for pentane

34. This permit authorizes emissions from internal floating roof storage tanks during planned floating roof landings associated with MSS activities. The requirements of Special Condition No. 24 apply to tank roof landings associated with MSS activities. For purposes of this permit tank roof landings associated with MSS are defined as anytime the tank is cleaned.

35. The following requirements apply to vacuum and air mover truck operations to support planned MSS at this site:

A. Prior to initial use, identify any liquid in the truck. Record the liquid level and document the VOC partial pressure. After each liquid transfer, identify the liquid, the volume transferred, and its VOC partial pressure.

B. If vacuum pumps or blowers are operated when liquid is in or being transferred to the truck, the following requirements apply:

(1) If the VOC partial pressure of the liquid in or being transferred to the truck is greater than 0.50 psi at 95°F, the vacuum/blower exhaust shall be routed to a control device or a controlled recovery system.

(2) Equip fill line intake with a “duckbill” or equivalent attachment if the hose end cannot be submerged in the liquid being collected.

(3) A daily record containing the information identified below is required for each vacuum truck in operation at the site each day.

(a) For each liquid transfer made with the vacuum operating, record the duration of any periods when air may have been entrained with the liquid transfer. The reason for operating in this manner and whether a “duckbill” or equivalent was used shall be recorded. Short, incidental periods, such as those necessary to walk from the truck to the fill line intake, do not need to be documented.

(b) If the vacuum truck exhaust is controlled with a control device other than an engine or oxidizer, VOC exhaust concentration upon commencing each transfer, at the end of each transfer, and at least every hour during each transfer shall be recorded, measured using an instrument meeting the requirements of Special Condition 33.A or B.

C. Record the volume in the vacuum truck at the end of the day, or the volume unloaded, as applicable.

D. The permit holder shall determine the vacuum truck emissions each month using the daily vacuum truck records and the calculation methods utilized in the permit application. If records of the volume of liquid transferred for each pick-up are not maintained, the emissions shall be determined using the physical properties of the liquid vacuumed with the greatest potential emissions. Rolling 12-month vacuum truck emissions shall also be determined on a monthly basis.

E. If the VOC partial pressure of all the liquids vacuumed into the truck is less than 0.10 psi, this shall be recorded when the truck is unloaded or leaves the plant site and the emissions may be estimated as the maximum potential to emit for a truck in that service as documented in the permit application. The recordkeeping requirements in Special Condition 35.A through 35.D do not apply.

36. The following requirements apply to frac, or temporary, tanks and vessels used in support of MSS activities.

A. The exterior surfaces of these tanks/vessels that are exposed to the sun shall be white or aluminum. This requirement does not apply to tanks/vessels that only vent to atmosphere when being filled, sampled, gauged, or when removing material.

B. These tanks/vessels must be covered and equipped with fill pipes that discharge within 6 inches of the tank/vessel bottom.

C. These requirements do not apply to vessels storing less than 450 gallons of liquid that are closed such that the vessel does not vent to atmosphere except when filling, sampling, gauging, or when removing material.

D. Frac tanks and temporary storage vessels shall be designed such that there are no standing losses emitted to the atmosphere. Standing loss emissions from frac tanks or temporary storage are not authorized by this permit.

E. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all frac tanks during the previous calendar month and the past consecutive 12-month period. This record must be updated by the last day of the month following. The record shall include tank identification number, dates put into and removed from service, control method used, tank capacity and volume of liquid stored in gallons, name of the material stored, VOC molecular weight, and VOC partial pressure at the estimated monthly average material temperature in psia. Filling emissions for tanks shall be calculated using the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Loading Operations" and standing emissions determined using: the TCEQ publication titled "Technical Guidance Package for Chemical Sources - Storage Tanks."

F. If the tank/vessel is used to store liquid with VOC partial pressure less than 0.10 psi at 95°F, records may be limited to the days the tank is in service and the liquid stored. Emissions may be estimated based upon the potential to emit as identified in the permit application.

37. No visible emissions shall leave the property due to abrasive blasting. **(11/20)**

38. Garnet Sand may be used for abrasive blasting. The permit holder may also use blast media that meet the criteria below: **(11/20)**

A. The media shall not contain asbestos or greater than 1.0 weight percent crystalline silica.

B. The weight fraction of any metal in the blast media with a short term ESL less than 50 micrograms per cubic meter as identified in the most recently published TCEQ ESL list shall not exceed the ESLmetal/1000.

C. The MSDS for each media used shall be maintained on site.

D. Blasting media usage and the associated emissions shall be recorded each month and the rolling 12 month total emissions updated.

39. Additional occurrences of MSS activities authorized by this permit may be authorized under permit by rule only if conducted in compliance with this permit's procedures, emission controls, monitoring, and recordkeeping requirements applicable to the activity.

40. Control devices required by this permit for emissions from planned MSS activities are limited to those types identified in this condition. Control devices shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours. Each device used must meet all the requirements identified for that type of control device.

Controlled recovery systems identified in this permit shall be directed to an operating process or to a collection system that is vented through a control device meeting the requirements of this permit condition.

A. Carbon Adsorption System (CAS).

(1) The CAS shall consist of 2 carbon canisters in series with adequate carbon supply for the emission control operation.

(2) The CAS shall be sampled downstream of the first can and the concentration recorded at least once every hour of CAS run time to determine breakthrough of the VOC. The sampling frequency may be extended using either of the following methods:

(a) It may be extended to up to 30 percent of the minimum potential saturation time for a new can of carbon. The permit holder shall maintain records including the calculations performed to determine the minimum saturation time.

(b) The carbon sampling frequency may be extended to longer periods based on previous experience with carbon control of a MSS waste gas stream. The past experience must be with the same VOC, type of facility, and MSS activity. The basis for the sampling frequency shall be recorded. If the VOC concentration on the initial sample downstream of the first carbon canister following a new polishing canister being put in place is greater than 100 ppmv above background, it shall be assumed that breakthrough occurred while that canister functioned as the final polishing canister and a permit deviation shall be recorded.

(3) The method of VOC sampling and analysis shall be by detector meeting the requirements of Special Condition 33.A or B.

(4) Breakthrough is defined as the highest measured VOC concentration at or exceeding 100 ppmv above background. When the condition of breakthrough of VOC from the initial saturation canister occurs, the waste gas flow shall be

switched to the second canister and a fresh canister shall be placed as the new final polishing canister within four hours. Sufficient new activated carbon canisters shall be maintained at the site to replace spent carbon canisters such that replacements can be done in the above specified time frame.

(5) Records of CAS monitoring shall include the following:

(a) Sample time and date.

(b) Monitoring results (ppmv).

(c) Canister replacement log.

(6) Single canister systems are allowed if the time the carbon canister is in service is limited to no more than 30 percent of the minimum potential saturation time. The permit holder shall maintain records for these systems, including the calculations performed to determine the saturation time. The time limit on carbon canister service shall be recorded and the expiration date attached to the carbon can.

B. Internal Combustion Engine.

(1) The internal combustion engine shall have a VOC destruction efficiency of at least 99 percent.

(2) The engine must have been stack tested with butane or propane to confirm the required destruction efficiency within the period specified in part iii below. VOC shall be measured in accordance with the applicable United States Environmental Protection Agency (EPA) Reference Method during the stack test and the exhaust flow rate may be determined from measured fuel flow rate and measured oxygen concentration. A copy of the stack test report shall be maintained with the engine. There shall also be documentation of acceptable VOC emissions following each occurrence of engine maintenance that may reasonably be expected to increase emissions including oxygen sensor replacement and catalyst cleaning or replacement. Stain tube indicators specifically designed to measure VOC concentration shall be acceptable for this documentation, provided a hot air probe or equivalent device is used to prevent error due to high stack temperature, and three sets of concentration measurements are made and averaged. Portable VOC analyzers meeting the requirements of Special Condition 33.A are also acceptable for this documentation.

(3) The engine shall be operated and monitored as specified below.

(a) If the engine is operated with an oxygen sensor-based air-to-fuel ratio (AFR) controller, documentation for each AFR controller that the manufacturer's or supplier's recommended maintenance has been performed, including replacement of the oxygen sensor as necessary for oxygen sensor-based controllers shall be maintained with the engine. The oxygen sensor shall be replaced at least quarterly in the absence of a specific written recommendation. The engine must have been stack tested within the past 12 months in accordance with part ii of this condition.

(b) The test period may be extended to 24 months if the engine exhaust is sampled once an hour when waste gas is directed to the engine using a detector meeting the requirements of Special Condition 33.A. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the engine. The concentrations shall be recorded and the MSS activity shall be stopped as soon as possible if the VOC concentration exceeds 100 ppmv above background.

(c) If an oxygen sensor-based AFR controller is not used, the engine exhaust to atmosphere shall be monitored continuously and the VOC concentration recorded at least once every 15 minutes when waste gas is directed to the engine. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the engine. The method of VOC sampling and analysis shall be by detector meeting the requirements of Special Condition 33.A. An alarm shall be installed such that an operator is alerted when outlet VOC concentration exceeds 100 ppmv above background. The MSS activity shall be stopped as soon as possible if the VOC concentration exceeds 100 ppmv above background for more than one minute. The date and time of all alarms and the actions taken shall be recorded. The engine must have been stack tested within the past 24 months in accordance with Paragraph B(2) of this condition.

C. Vapor Combustor

(1) Temporary portable vapor combustors shall provide no less than 99 percent DRE control of the waste gas directed to it. This may be demonstrated by one of the following:

a. maintaining thermal vapor combustor firebox exit temperature at not less than 1400°F with waste gas flows limited to assure at least a 0.5 second residence time in the fire box while waste gas is being fed into the combustor; or

b. having completed a control efficiency demonstration (stack test) in accordance with the approved test methods in 30 TAC 115.545 (relating to Approved Test Methods) within the past 12 months and maintaining vapor combustor firebox exit temperature at not less than that temperature maintained during the demonstration with waste gas flow limited to that maintained during the demonstration while waste gas is being fed into the combustor.

(2) The vapor combustor exhaust temperature shall be continuously monitored and recorded when waste gas is directed to the combustor. The temperature measurements shall be made at intervals of six minutes or less and recorded at that frequency.

(3) The temperature measurement device shall be installed, calibrated, and maintained according to accepted practice and the manufacturer's specifications. The device shall have an accuracy of the greater of ±0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5ºC.

D. Pilot and assist gas combusted shall be sweet natural gas containing no more than 0.2 grains of total sulfur per 100 dry standard cubic feet. The volume of pilot and assist gas shall be monitored and recorded with records being updated on a monthly basis.

41. The following requirements apply to capture systems for temporary portable vapor combustors used to support MSS activities:

A. If used to control pollutants other than particulate conduct a visual, audible, and/or olfactory inspection of the capture system prior to each use and after each month of continuous operation to verify there are no leaking components in the capture system; or

B. The control device shall not have a bypass, or if there is a bypass for the control device, comply with either of the following requirements:

(1) Install a flow indicator that records and verifies zero flow at least once every fifteen minutes immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere; or

(2) prior to initial use and each month of continuous service, inspect the valves, verifying that the position of the valves and the condition of the car seals prevent flow out the bypass

A bypass does not include authorized analyzer vents, highpoint bleeder vents, low point drains, or rupture discs upstream of pressure relief valves if the pressure between the disc and relief valve is monitored and recorded at least weekly. A deviation shall be reported if the monitoring or inspections indicate bypass of the control device when it is required to be in service.

C. Records of the inspections required shall be maintained and if the results of any of the above inspections are not satisfactory, the permit holder shall promptly take necessary corrective action.

Dated: November 30, 2020

Emission Sources - Maximum Allowable Emission Rates

Permit Number 122362 and PSDTX1430M1

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T-101	Tank T-101	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-102	Tank T-102	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-103	Tank T-103	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-104	Tank T-104	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-105	Tank T-105	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-106	Tank T-106	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-107	Tank T-107	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-108	Tank T-108	VOC	9.94	5.52
		H_2S	0.01	<0.01
T-109	Tank T-109	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-110	Tank T-110	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-111	Tank T-111	VOC	9.11	6.54
		H_2S	0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T-112	Tank T-112	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-113	Tank T-113	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-114	Tank T-114	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-115	Tank T-115	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-116	Tank T-116	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-117	Tank T-117	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-118	Tank T-118	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-119	Tank T-119	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-120	Tank T-120	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-121	Tank T-121	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 122	Tank T- 122	VOC	9.91	6.02
		H_2S	0.01	<0.01
T- 123	Tank T- 123	VOC	9.91	6.02
		H_2S	0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T- 124	Tank T- 124	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 125	Tank T- 125	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 126	Tank T- 126	VOC	8.86	4.00
		H_2S	0.01	<0.01
T- 127	Tank T- 127	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 128	Tank T- 128	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-129	Tank T-129	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-130	Tank T-130	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-131	Tank T-131	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-132	Tank T-132	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-133	Tank T-133	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-134	Tank T-134	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-135	Tank T-135	VOC	9.11	6.54
		H_2S	0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
T-136	Tank T-136	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-137	Tank T-137	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-138	Tank T-138	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-139	Tank T-139	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 140	Tank T- 140	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 141	Tank T- 141	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 142	Tank T- 142	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 143	Tank T- 143	VOC	9.11	6.54
		H_2S	0.01	<0.01
T- 144	Tank T- 144	VOC	9.11	6.54
		H_2S	0.01	<0.01
T-201	Tank T-201	VOC	2.03	0.52
		H_2S	<0.01	<0.01
T-202	Tank T-202	VOC	2.03	0.52
		H_2S	<0.01	<0.01
EMERTK1	Emergency Relief Tank 1	VOC	11.36	0.36
		H_2S	0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
EMERTK2	Emergency Relief Tank 2	VOC	11.36	0.36
		H_2S	0.01	<0.01
TANKCAP	Tank Cap	VOC	-	193.22
		H_2S	-	0.16
DOCK-2	Uncollected Loading Dock No. 2	VOC	11.87	-
		H_2S	0.01	-
DOCK-4	Uncollected Loading Dock No. 4	VOC	11.87	-
		H_2S	0.01	-
DOCK-5	Uncollected Loading Dock No. 5	VOC	11.87	-
		H_2S	0.01	-
DOCK CAP	Uncollected Dock Emissions Cap	VOC	-	35.54
		H_2S	-	0.04
VCU-1	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
VCU-2	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-
VCU-3	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-
VCU-5	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
VCU-6	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-
VCU-7	Collected and Controlled Marine Loading	VOC	10.78	-
		NO_x	0.92	-
		CO	0.39	-
		PM	0.57	-
		PM_{10}	0.57	-
		$PM_{2.5}$	0.57	-
		SO_2	7.93	-
		H_2S	<0.01	-
VCUCAP	Collected and Controlled Marine Loading Annual Emissions Cap	VOC	-	36.53
		NO_x	-	9.06
		CO	-	4.16
		PM	-	5.12
		PM_{10}	-	5.12
		$PM_{2.5}$	-	5.12
		SO_2	-	63.25
		H_2S	-	0.03
TRUCKLOAD	Uncollected Truck Loading	VOC	2.91	0.04
		H_2S	<0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
VCU-4	Controlled Truck Loading / Routine Tank Floating Roof Landing Emissions	VOC	3.51	0.28
		NO_x	2.28	0.46
		CO	1.53	0.34
		PM	0.17	0.03
		PM_{10}	0.17	0.03
		$PM_{2.5}$	0.17	0.03
		SO_2	4.90	0.27
		H_2S	<0.01	<0.01
PORTVC	Portable VCU for Controlled Roof Landings & Degas	VOC	1.57	0.46
		NO_x	1.61	1.11
		CO	1.07	0.73
		PM	0.12	0.06
		PM_{10}	0.12	0.06
		$PM_{2.5}$	0.12	0.06
		SO_2	4.33	1.20
		H_2S	<0.01	0.01
FUG	Equipment Fugitives (5)	VOC	2.16	9.48
		H_2S	<0.01	0.01
MSS-CONT	Equipment MSS Vapors Vented	VOC	0.52	0.01
		NO_x	0.98	0.02
		CO	0.66	0.01
		PM	0.07	<0.01
		PM_{10}	0.07	<0.01
		$PM_{2.5}$	0.07	<0.01
		SO_2	0.82	0.02
		H_2S	<0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
MSS-CONT	Equipment MSS Refilling	VOC	0.31	0.01
		NO_x	0.59	0.01
		CO	0.39	0.01
		PM	0.04	<0.01
		PM_{10}	0.04	<0.01
		$PM_{2.5}$	0.04	<0.01
		SO_2	0.49	0.01
		H_2S	<0.01	<0.01
MSS-CONT	Air Mover and Vacuum Truck MSS	VOC	0.17	0.01
		NO_x	0.31	0.01
		CO	0.21	0.01
		PM	0.02	<0.01
		PM_{10}	0.02	<0.01
		$PM_{2.5}$	0.02	<0.01
		SO_2	0.26	0.01
		H_2S	<0.01	<0.01
MSS-CONT	Frac Tank Emissions	VOC	0.20	0.03
		NO_x	0.38	0.06
		CO	0.25	0.04
		PM	0.03	<0.01
		PM_{10}	0.03	<0.01
		$PM_{2.5}$	0.03	<0.01
		SO_2	0.32	0.06
		H_2S	<0.01	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
MSS-CONT	Pilot Emissions	VOC	<0.01	0.01
		NO_x	0.04	0.17
		CO	0.02	0.10
		PM	<0.01	0.01
		PM_{10}	<0.01	0.01
		$PM_{2.5}$	<0.01	0.01
		SO_2	<0.01	<0.01
MSS-CONT	Controlled MSS Cap	VOC	-	0.07
		NO_x	-	0.27
		CO	-	0.17
		PM	-	0.02
		PM_{10}	-	0.02
		$PM_{2.5}$	-	0.02
		SO_2	-	0.10
		H_2S	-	<0.01
MSS-ATM	Equipment MSS Vapors Vented	VOC	102.11	1.09
		H_2S	0.09	<0.01
MSS-ATM	Equipment Draining	VOC	20.12	0.30
		H_2S	0.02	<0.01
MSS-ATM	Equip Vapor Space Emission (to Atm Post Control)	VOC	8.94	0.18
		H_2S	0.01	<0.01
MSS-ATM	Equipment MSS Refilling	VOC	61.27	0.66
		H_2S	0.05	<0.01
MSS-ATM	Uncontrolled Venting from Storage Tank Degassing	VOC	257.41	5.45
		H_2S	0.27	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	**Source Name (2)**	**Air Contaminant Name (3)**	**Emission Rates**	
			lbs/hour	**TPY (4)**
MSS-ATM	Misc Inherently Low Emitting Maint Activities	VOC	21.36	0.21
		H_2S	0.02	<0.01
MSS-ATM	Uncontrolled MSS Emission Cap	VOC	471.20	7.90
		H_2S	0.45	<0.01
BLAST	MSS Abrasive Blasting	PM	4.29	4.86
		PM_{10}	0.51	0.58
		$PM_{2.5}$	0.08	0.09
HOPPER	MSS Hopper Loading	PM	0.14	0.01
		PM_{10}	0.08	0.01
		$PM_{2.5}$	0.01	0.01
BLASTLOAD	MSS Blast Pot Loading	PM	0.09	0.01
		PM_{10}	0.03	0.01
		$PM_{2.5}$	0.01	0.01
ROLLOFF	MSS Roll-off Box Loading	PM	0.09	0.01
		PM_{10}	0.03	0.01
		$PM_{2.5}$	0.01	0.01

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources, use area name or fugitive source name.
(3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
NO_x - total oxides of nitrogen
SO_2 - sulfur dioxide
PM - total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented
PM_{10} - total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$, as represented
$PM_{2.5}$ - particulate matter equal to or less than 2.5 microns in diameter
CO - carbon monoxide
H_2S - hydrogen sulfide
(4) Compliance with annual emission limits (tons per year) is based on a 12-month rolling period.
(5) Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.

Date: November 30, 2020

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 18, 2020

Mr. Clayton Curtis
VP Regulatory Affairs
Moda Ingleside, LLC
1000 Louisiana St Ste 7100
Houston, TX 77002

Permit by Rule Registration Number: 159913
Moda Ingleside, LLC
Project Description/Unit: Moda Ingleside Energy Center
City: Ingleside, San Patricio County
Regulated Entity Number: RN101225746
Customer Reference Number: CN605745140
30 TAC § 106.183
30 TAC § 106.261
30 TAC § 106.263
30 TAC § 106.472
Affected Permit(s): 122362

This is in response to your Permit by Rule (PBR) registration submitted through the online ePermits process for your facility located near Ingleside, San Patricio County. Based on the information submitted and review completed by the Rule Registration Section, this is an acknowledgement that Moda Ingleside, LLC has certified emissions associated with Moda Ingleside Energy Center under the Permit By Rule(s) listed above. For rule information see: www.tceq.texas.gov/permitting/air/nav/numerical_index.html. Records must be maintained in accordance with Title 30 Texas Administrative Code § 106.8 to demonstrate compliance with the claimed PBRs.

As referenced in 30 TAC § 116.116(d)(2), all changes authorized under Chapter 106 to a permitted facility shall be incorporated into the NSR Permit No. 122362 when it is amended or renewed.

As a reminder, regardless of the authorization mechanism, all facilities must be in compliance and operate in accordance with all rules and regulations of the TCEQ and the U.S. Environmental Protection Agency. Facilities not operating in accordance with these rules and regulations, or that misrepresented or failed to fully disclose all relevant facts in obtaining this authorization may be subject to formal enforcement action.

This action is taken under authority delegated by the Executive Director of the TCEQ. If you need further information or have questions, please contact the Rule Registrations Section at (512) 239-1250 or write to the Texas Commission on Environmental Quality, Office of Air, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

Kristyn Campbell

Kristyn Campbell, Manager

Rule Registrations Section
Air Permits Division
Texas Commission on Environmental Quality

[Project Number: 311360]

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 14, 2020

MR CLAYTON CURTIS
VP REGULATORY AFFAIRS
MODA INGLESIDE LLC
1000 LOUISIANA ST STE 7100
HOUSTON TX 77002-5029

Re: Pollution Control Projects Air Quality Standard Permit
(Effective 2/9/2011)
Standard Permit Registration Number: 162551
Standard Permit Expiration Date: October 14, 2030
Moda Ingleside Llc
Moda Ingleside Energy Center
Affected Permit: 122362/PSDTX1430M1
Ingleside, San Patricio County
Regulated Entity Number: RN101225746
Customer Reference Number: CN605745140

Dear Mr. Curtis:

Moda Ingleside LLC submitted an application on September 2, 2020 to register construction related to Pollution Control Projects to be located at 1450 Lexington Blvd, Ingleside, San Patricio County. We understand that this registration is for emissions associated with installation of a back-up Vapor Combustor (EPN: VCU-8).

The Texas Commission on Environmental Quality (TCEQ) has determined that your proposed emissions are authorized by this standard permit pursuant to Title 30 Texas Administrative Code § 116.602 and Texas Health and Safety Code § 382.05195, if constructed and operated as described in your registration. Authorized emissions are listed on the attached table.

You must begin construction or modification of these facilities in accordance with this standard permit no later than 18 months after the date of this letter. After completion of construction or modification, the appropriate TCEQ Regional Office must be notified prior to commencing operation and the facility shall be operated in compliance with all applicable conditions of the claimed standard permit.

You are reminded that 30 TAC § 116.615 requires that any construction or change authorized by this standard permit be administratively incorporated into the affected facilities' permit(s) at the next amendment or renewal.

You are also reminded that these facilities must comply with all rules and regulations of the TCEQ and of the U.S. Environmental Protection Agency at all times.

If you need further information or have any questions, please contact Mr. James Qu at (512) 239-1287 or write to the Texas Commission on Environmental Quality, Office of Air, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

Re: Standard Permit Registration Number 162551

Sincerely,

Kristyn Campbell

Kristyn Campbell, Manager
Rule Registrations Section
Air Permits Division
Texas Commission on Environmental Quality

cc: Air Section Manager, Region 14 – Corpus Christi

Project Number: 319730

Standard Permit Maximum Emission Rates Table
Permit Number 162551

The facilities and emissions included in this table have been represented and reviewed as the maximum emissions authorized by this standard permit registration.

Emission Point No.	Source Name	NSR Permit	Pollutant	Emissions	
				lbs/hr	tpy
VCU-8	**Collected and Controlled Marine Loading + Pilot**	**162551**	**VOC**	10.78	11.26
			NOx	0.92	2.63
			CO	0.39	1.13
			SO_2	7.93	21.72
			PM	0.57	1.58
			H_2S	<0.01	0.01
VCUCAP	**Collected and Controlled Marine Loading Annual Emissions Cap**	**122362/PSDTX1430M1**	**VOC**	-	36.53
			NOx	-	9.06
			CO	-	4.16
			SO_2	-	63.25
			PM	-	5.12
			H_2S	-	0.03

VOC - volatile organic compounds
NO_x - total oxides of nitrogen
CO - carbon monoxide
PM - total particulate matter, suspended in the atmosphere, including PM_{10} and $PM_{2.5}$, as represented
PM_{10} - total particulate matter equal to or less than 10 microns in diameter, including $PM_{2.5}$ as represented
$PM_{2.5}$ - particulate matter equal to or less than 2.5 microns in diameter
SO_2 - sulfur dioxide
H_2S - hydrogen sulfide

**Fugitive emissions are an estimate only and should not be considered as a maximum allowable

Date: October 14, 2020

Appendix E

EMISSION CALCULATIONS

Table E-1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside, LLC

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
DOCK-2	DOCK-2	Loading Dock No. 2 - Loading Fugitives	[1]	11.87	--	--	--	--	--	--	--	--	--	--	--	--	--	9.91E-03	--
DOCK-4	DOCK-4	Loading Dock No. 4 - Loading Fugitives	[1]	11.87	--	--	--	--	--	--	--	--	--	--	--	--	--	9.91E-03	--
DOCK-5	DOCK-5	Loading Dock No. 5 - Loading Fugitives	[1]	11.87	--	--	--	--	--	--	--	--	--	--	--	--	--	9.91E-03	--
DOCK-2LO	DOCK-2LO	Loading Dock No. 2 - Low VP Loading	[1]	17.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DOCK-4LO	DOCK-4LO	Loading Dock No. 4 - Low VP Loading	[1]	17.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DOCK-5LO	DOCK-5LO	Loading Dock No. 5 - Low VP Loading	[1]	17.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DOCK CAP	DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO	Dock Emissions Cap	[2]	--	49.34	--	--	--	--	--	--	--	--	--	--	--	--	--	0.05
VCU-1	VCU-1, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-2	VCU-2, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-3	VCU-3, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-5	VCU-5, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-6	VCU-6, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-7	VCU-7, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCU-8	VCU-8, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	5.06	--	8.12	--	2.05	--	0.61	--	0.61	--	0.61	--	7.93	--	4.22E-03	--
VCUCAP	VCU-1 to 3, VCU-5 to 8	Collected and Controlled Marine Loading + Pilot Annual Emissions Cap	[4]	--	47.29	--	48.00	--	10.48	--	7.05	--	7.05	--	7.05	--	83.45	--	0.04
T-101	T-101	Tank T-101	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03
T-102	T-102	Tank T-102	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03
T-103	T-103	Tank T-103	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-104	T-104	Tank T-104	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03
T-105	T-105	Tank T-105	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03

Table E-1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside, LLC

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
T-106	T-106	Tank T-106	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-107	T-107	Tank T-107	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03
T-108	T-108	Tank T-108	[5]	9.68	5.56	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.03
T-109	T-109	Tank T-109	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-110	T-110	Tank T-110	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-111	T-111	Tank T-111	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-112	T-112	Tank T-112	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-113	T-113	Tank T-113	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-114	T-114	Tank T-114	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-115	T-115	Tank T-115	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-116	T-116	Tank T-116	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-117	T-117	Tank T-117	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-118	T-118	Tank T-118	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-119	T-119	Tank T-119	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-120	T-120	Tank T-120	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-201	T-201	Tank T-201	[5]	2.03	0.54	--	--	--	--	--	--	--	--	--	--	--	--	0.01	2.94E-03
T-202	T-202	Tank T-202	[5]	2.03	0.54	--	--	--	--	--	--	--	--	--	--	--	--	0.01	2.94E-03
T-121	T-121	Tank T-121	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-122	T-122	Tank T-122	[5]	9.66	3.87	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.02
T-123	T-123	Tank T-123	[5]	9.66	3.87	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.02
T-124	T-124	Tank T-124	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-125	T-125	Tank T-125	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-126	T-126	Tank T-126	[5]	12.45	2.62	--	--	--	--	--	--	--	--	--	--	--	--	0.07	0.01
T-127	T-127	Tank T-127	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-128	T-128	Tank T-128	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-129	T-129	Tank T-129	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-130	T-130	Tank T-130	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-131	T-131	Tank T-131	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-132	T-132	Tank T-132	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-133	T-133	Tank T-133	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-134	T-134	Tank T-134	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-135	T-135	Tank T-135	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-136	T-136	Tank T-136	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-137	T-137	Tank T-137	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-138	T-138	Tank T-138	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-139	T-139	Tank T-139	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-140	T-140	Tank T-140	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-141	T-141	Tank T-141	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-142	T-142	Tank T-142	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-143	T-143	Tank T-143	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
T-144	T-144	Tank T-144	[5]	8.28	3.66	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02
RT-1	RT-1	Emergency Relief Tank 1	--	11.34	0.31	--	--	--	--	--	--	--	--	--	--	--	--	0.06	1.68E-03
RT-2	RT-2	Emergency Relief Tank 2	--	11.34	0.31	--	--	--	--	--	--	--	--	--	--	--	--	0.06	1.68E-03

Table E-1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside, LLC

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TANKCAP	T-101 through T-144, T-201, T-202, RT-1, RT-2	Tank Cap	[6]	--	169.22	--	--	--	--	--	--	--	--	--	--	--	--	--	0.94
BT-201	BT-201	Bunker Oil Storage Tank BT-201	--	1.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BT-202	BT-202	Bunker Oil Storage Tank BT-202	--	1.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BT-203	BT-203	Bunker Oil Storage Tank BT-203	--	1.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TANKCAP2	BT-201, BT-202, BT-203	Tank Cap 2	--	--	10.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TRUCKLOAD	TRUCKLOAD	Uncollected Truck Loading	[7]	2.91	0.04	--	--	--	--	--	--	--	--	--	--	--	--	0.01	1.48E-04
VCU-4	VCU-4, TRUCKLOAD, T-101 through T-108, T-110, and T-111	Controlled Truck Loading / Routine Tank Floating Roof Landing Emissions + Pilot	[8]	3.51	0.28	2.44	0.48	1.64	0.35	0.18	0.03	0.18	0.03	0.18	0.03	7.16	0.30	5.80E-03	3.82E-04
FUG	FUG	Equipment Fugitives	--	2.52	10.88	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.05
PORTVC	T-109, T-112 through T-144, T-201, T-202	Portable VCU for Controlled Tank Roof Landings and Degassings + Pilot	--	1.57	0.45	1.71	1.16	1.14	0.76	0.13	0.06	0.13	0.06	0.13	0.06	4.33	1.18	2.15E-03	3.41E-03
MSS-CONT	*EQDEGAS*	*Equipment MSS Vapors*	--	*0.52*	*0.01*	*1.05*	*0.02*	*0.70*	*0.02*	*0.08*	*1.72E-03*	*0.08*	*1.72E-03*	*0.08*	*1.72E-03*	*0.82*	*0.02*	*4.38E-04*	*9.63E-06*
MSS-CONT	*EQREFILL*	*Equipment MSS Refilling*	--	*0.31*	*6.92E-03*	*0.63*	*0.01*	*0.42*	*9.26E-03*	*0.05*	*1.03E-03*	*0.05*	*1.03E-03*	*0.05*	*1.03E-03*	*0.49*	*0.01*	*2.63E-04*	*5.78E-06*
MSS-CONT	*AIRVACMV*	*Air Mover and Vacuum Truck MSS Emissions*	--	*0.17*	*6.65E-03*	*0.33*	*0.01*	*0.22*	*8.90E-03*	*0.02*	*9.92E-04*	*0.02*	*9.92E-04*	*0.02*	*9.92E-04*	*0.26*	*0.01*	*1.39E-04*	*5.56E-06*
MSS-CONT	*FRACTKS*	*Frac Tank Emissions*	--	*0.20*	*0.03*	*0.40*	*0.06*	*0.27*	*0.04*	*0.03*	*4.52E-03*	*0.03*	*4.52E-03*	*0.03*	*4.52E-03*	*0.32*	*0.06*	*1.69E-04*	*3.06E-05*
MSS-CONT	*MSS-CONT*	*Pilot Emissions*	--	*3.00E-03*	*0.01*	*0.04*	*0.17*	*0.02*	*0.10*	*2.10E-03*	*9.20E-03*	*2.10E-03*	*9.20E-03*	*2.10E-03*	*9.20E-03*	*1.62E-04*	*7.10E-04*	--	--
MSS-CONT	T-101 through T-144, T-201, T-202, RT-1, RT-2	Controlled MSS Cap	[9]	--	0.07	--	0.28	--	0.17	--	0.02	--	0.02	--	0.02	--	0.10	--	5.15E-05
MSS-ATM	*EQVENT*	*Equipment MSS Vapors Vented*	[10]	*102.11*	*1.22*	--	--	--	--	--	--	--	--	--	--	--	--	*0.09*	*9.13E-04*
MSS-ATM	*EQDRAIN*	*Equipment Draining*	[10]	*20.12*	*0.31*	--	--	--	--	--	--	--	--	--	--	--	--	*0.02*	*2.54E-04*
MSS-ATM	*EQDGSATM*	*Equipment Vapor Space Emissions Atmosphere Post Control*	[10]	*8.94*	*0.18*	--	--	--	--	--	--	--	--	--	--	--	--	*7.47E-03*	*1.51E-04*
MSS-ATM	*EQREFATM*	*Equipment MSS Refilling*	[10]	*61.27*	*0.73*	--	--	--	--	--	--	--	--	--	--	--	--	*0.05*	*5.48E-04*
MSS-ATM	*T-101 through T-144, T-201, T-202, RT-1, RT-2, BT-201, BT-202, BT-203*	*Uncontrolled Venting from Storage Tank Degassing*	[10]	*210.96*	*5.48*	--	--	--	--	--	--	--	--	--	--	--	--	*0.24*	*5.85E-03*
MSS-ATM	*Miscellaneous*	*Miscellaneous Inherently Low Emitting Maintenance Activities*	--	*21.36*	*0.21*	--	--	--	--	--	--	--	--	--	--	--	--	*0.02*	*6.57E-04*

Table E-1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside, LLC

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
MSS-ATM	EQDEGAS, EQDRAIN, EQDGSATM, EQREFILL, T-101 through T-144, T-201, T-202, RT-1, RT-2, BT-201, BT-202, BT-203	Uncontrolled MSS Emission Cap	[11]	424.76	8.13	--	--	--	--	--	--	--	--	--	--	--	--	0.42	8.37E-03
BLAST	BLAST	MSS Abrasive Blasting	--	--	--	--	--	--	--	4.29	4.86	0.51	0.58	0.08	0.09	--	--	--	--
HOPPER	HOPPER	MSS Hopper Loading	--	--	--	--	--	--	--	0.14	0.01	0.08	0.01	0.01	0.01	--	--	--	--
BLASTLOAD	BLASTLOAD	MSS Blast Pot Loading	--	--	--	--	--	--	--	0.09	0.01	0.03	0.01	0.01	0.01	--	--	--	--
ROLLOFF	ROLLOFF	MSS Roll-off Box Loading	--	--	--	--	--	--	--	0.09	0.01	0.03	0.01	0.01	0.01	--	--	--	--
		Sitewide Emissions	**[12]**	--	**295.93**	--	**49.92**	--	**11.76**	--	**12.05**	--	**7.77**	--	**7.28**	--	**85.03**	--	**1.09**

Notes:
[1] Values per dock are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table E-3 and Table E-4.
[2] Values for EPN DOCK CAP are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table E-3 and Table E-4.
[3] Values per VCU are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table E-3 and Table E-4.
[4] Values for EPN VCUCAP are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table E-3 and Table E-4.
[5] Storage tank emissions represented are based on the maximum hourly and annual emission rates from storage of condensate and crude oil.
[6] The tank cap is based on the maximum emissions from either: 1. Condensate emissions from the 12 highest emitting tanks + remaining tanks in crude service, or 2. Crude emissions from all tanks.
Maximum VOC emissions result from 12 tanks in condensate service with the remaining tanks in crude service. Maximum H2S emissions result from all tanks in crude service.
[7] Emissions are the maximum from either crude or condensate loading from Table E-18.
[8] Hourly emissions are the sum of tank truck loading and 2 tanks simultaneously landed or degassed. The worst-case emissions from crude or condensate is used as the hourly value for each activity.
Annual emissions are the sum of tank truck loading, product change roof landings, and tank degassing. The worst-case emissions from crude or condensate is used for each activity.
[9] Annual emissions are the sum of all MSS-CONT sources.
[10] Short-term emissions are the maximum from PBR Registration No. 159913 and those from Table E-14 or Table E-19. Annual emissions are the sum from PBR Registration No. 159913 and those from Table E-14 or Table E-19.
[11] Uncontrolled MSS Emission Cap is the sum of FINs EQDEGAS, EQDRAIN, EQDGSATM, EQREFILL, and T-101 through T-144, T-201, and T-202 uncontrolled venting.
[12] Sitewide emissions are the sum of EPNs DOCK CAP, VCUCAP, TANKCAP, TRUCKLOAD, VCU-4, FUG, MSS-CONT, MSS-ATM, BLAST, HOPPER, BLASTLOAD, and ROLLOFF.

Table E-2
Federal Applicability Analysis
Moda Ingleside Energy Center
Moda Ingleside, LLC

Analysis for Amendment Issued December 6, 2019

EPN	VOC (tpy)	NO_x (tpy)	CO (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	H_2S (tpy)
DOCK CAP	35.54	--	--	--	--	--	--	0.04
VCUCAP	36.53	37.22	8.21	5.46	5.46	5.46	63.25	0.03
TANKCAP	133.28	--	--	--	--	--	--	0.14
VCU-4	0.28	0.48	0.35	0.03	0.03	0.03	0.27	3.67E-04
PORTVC	0.45	1.16	0.76	0.06	0.06	0.06	1.18	3.41E-03
MSS-CONT	0.07	0.28	0.17	0.02	0.02	0.02	0.10	5.15E-05
MSS-ATM	7.82	--	--	--	--	--	--	0.01
Total	**213.97**	**39.14**	**9.49**	**5.56**	**5.56**	**5.56**	**64.80**	**0.22**
Baseline [1]	238.90	81.50	162.71	4.40	4.40	4.40	61.24	1.00
Project Emissions Increases (Total Affected Units' PTE - Baseline)	-24.93	-42.36	-153.22	1.16	1.16	1.16	3.56	-0.78
PSD Major Modification Threshold	40	40	100	25	15	10	40	10
Project Increases < PSD Major Modification Threshold?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Analysis for Proposed Project

EPN	VOC (tpy)	NO_x (tpy)	CO (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	H_2S (tpy)
DOCK CAP	49.34	--	--	--	--	--	--	0.05
VCUCAP	47.29	48.00	10.48	7.05	7.05	7.05	83.45	0.04
TANKCAP	169.22	--	--	--	--	--	--	0.94
Total	**265.86**	**48.00**	**10.48**	**7.05**	**7.05**	**7.05**	**83.45**	**1.03**
Permitted Emissions [2]	265.29	9.06	4.16	5.12	5.12	5.12	63.25	0.08
Project Emissions Increases (Total Affected Units' PTE - Baseline)	0.57	38.94	6.32	1.93	1.93	1.93	20.20	0.95
PSD Major Modification Threshold	40	40	100	25	15	10	40	10
Project Increases < PSD Major Modification Threshold?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Notes:
[1] Sum of DOCK CAP, VCUCAP, TANKCAP, MSS-CONT, and MSS-ATM from NSR Permit No. 122362 issued February 11, 2019.
[2] Sum of DOCK CAP, VCUCAP, and TANKCAP from NSR Permit No. 122362 issued November 30, 2020.

Table E-3
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC = Inputs

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 180,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.

Parameter	Basis	Value				Units	Information Source
		Ship/Ocean-Going Barge Loading					
		Crude and Condensate		Crude Only	Bunker Oil		
Product Loaded		**Condensate**	**Crude Oil**	**Crude Oil**	**Bunker Oil**		
Maximum Hourly Loading Rate	Per Dock	80,000	80,000	80,000	2,500	barrels/hr	Maximum loading rate is per dock.
Maximum Annual Throughput		268,992,000	350,400,000	350,400,000	2,880,000	barrels/yr	Crude and Condensate: Value is the minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly loading rate (per dock) × 8,760 hr/yr × 0.5, which assumes that a dock is actively loaded at the maximum loading rate for half of the year. A dock could be operated more than half of the hours in a year at a loading rate that is less than the maximum hourly loading rate. Bunker Oil: Annual throughput is equivalent to 1 turnover per tank, per month (3 tanks × 12 months × 80,000 bbl) Per-dock annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual dock.
Maximum Hourly Capacity	Per VCU	30,000	30,000	30,000	--	barrels/hr	
Maximum Annual Capacity		262,800,000	262,800,000	262,800,000	--	barrels/yr	Minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly capacity (per VCU) × 8,760 hr/yr. The value for condensate is the total barrels of condensate that can be loaded annually. The crude throughput in the crude and condensate loading scenario is the difference between the maximum hourly capacity (per VCU) × 8,760 hr/yr and annual condensate loading. Per-VCU annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual VCU.
Maximum Hourly Loading Rate	Total	180,000	180,000	180,000	7,500	barrels/hr	Maximum loading rate is combined for controlled products at Docks 2, 4, and 5 and is not per dock.
Maximum Annual Throughput		268,992,000	650,448,000	919,440,000	2,880,000	barrels/yr	Annual condensate throughput is limited to 12 of the 467k bbl tanks tanks in condensate service. In the crude and condensate service scenario, crude throughput is the total tanks' throughput less the condensate throughput. In the crude only scenario, the throughput assumes that all of the tanks' throughput could be crude. Bunker oil total throughput is equal to the maximum throughput per dock. Per-dock annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual dock.
Hydrogen Sulfide Content		10	10	10	--	ppmw	
Saturation Factor (S)		0.2	0.2	0.2	0.2		Saturation factor obtained for submerged loading: barges and ships obtained from U.S. EPA AP-42 Chapter 5, Section 5.2 Transportation and Marketing of Petroleum Liquids (July 2008), Table 5.2-1.
Physical Properties							
Maximum True Vapor Pressure (P_{max})		11.00	11.00	11.00	0.06	psia	Condensate: P_{ave} calculated using Figure 7.1-14b from AP-42 Section 7.1 (Jun 2020). RVP = 13.5, T = 70°F. Crude: P_{ave} calculated using Figure 7.1-13b from AP-42 Section 7.1 (Jun 2020). RVP = 10, T = 70°F. Maximum TVP is limited to 11.00 psia. Bunker Oil: TVP is based on SDS data.
Average True Vapor Pressure (P_{ave})		8.70	8.74	8.74	0.06	psia	
Vapor Molecular Weight (M)		65	50	50	130	lb/lb-mole	MW values obtained from U.S. EPA AP-42, Chapter 7.1 (Jun 2020), Table 7.1-2, for Crude Oil (RVP 5), condensate is Motor Gasoline and bunker oil is No. 6 Fuel Oil.
Maximum Loading Temperature (T_{max})		95	95	95	120	deg. F	Bunker oil is heated to 120°F.
		555	555	555	580	deg. R	
Average Loading Temperature (T_{ave})		70	70	70	120	deg. F	
		530	530	530	580	deg. R	
Uncontrolled Loading Loss							
VOC Emission Factor at Maximum Loading Temp. (LLmax)		3.21	2.47	2.47	0.03	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLmax = 12.46 x S x P_{max} x M / T_{max}
VOC Emission Factor at Average Loading Temp. (LLave)		2.66	2.05	2.05	0.03	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLavg = 12.46 x S x P_{avg} x M / T_{avg}
Maximum Hourly Loading Loss	Per Dock	10,787	8,298	8,298	3.40	lb/hr	Maximum hourly loading rate (per dock) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss		15,014	15,117	15,117	1.96	tpy	Maximum annual throughput (per dock) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Per VCU	4,045	3,112	3,112	--	lb/hr	Maximum hourly capacity (per VCU) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss		14,668	11,338	11,338	--	tpy	Maximum annual capacity (per VCU) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Total	24,271	18,670	18,670	10.20	lb/hr	Maximum hourly loading rate (total) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss		15,014	28,062	39,668	1.96	tpy	Maximum annual throughput (total) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Vapor Collection System							
Collection Efficiency		99.89%	99.89%	99.89%	--	%	Vapor collection efficiency (CE)
Vapor Combustion (EPNs VCU-1 to VCU-3, VCU-5 to VCU-8)							
Destruction Removal Efficiency (DRE)		99.9%	99.9%	99.9%	--	%	Destruction Removal Efficiency (DRE)

Table E-3
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC

= Inputs

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 180,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.

Parameter	Basis	Value				Units	Information Source
		Ship/Ocean-Going Barge Loading					
		Crude and Condensate		Crude Only	Bunker Oil		
Product Loaded		Condensate	Crude Oil	Crude Oil	Bunker Oil		
Uncombusted Loading Emissions (EPNs VCU-1 to VCU-3, VCU-5 to VCU-8)							
VOC Hourly Emissions	Per VCU (VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8 [hourly only])	4.04	3.11	3.11	--	lb/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE (%)) x (1 - DRE %)
VOC Annual Emissions		14.65	11.33	11.33	--	tpy	Annual loading loss (per VCU) (tpy) x (CE (%)) x (1 - DRE %)
H_2S Hourly Emissions		1.50E-03	3.38E-03	3.38E-03	--	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
H_2S Annual Emissions		5.44E-03	0.01	0.01	--	tpy	H_2S Emissions (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
SO_2 Hourly Emissions		2.82	6.34	6.34	--	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		10.22	23.10	23.10	--	tpy	SO_2 (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
VOC Hourly Emissions	Total (VCUCAP)	24.24	18.65	18.65	--	lb/hr	Maximum hourly loading loss (total) (lb/hr) x (CE (%)) x (1 - DRE %) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		15.00	28.03	39.62	--	tpy	Annual loading loss (total) (tpy) x (CE (%)) x (1 - DRE %) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		9.00E-03	0.02	0.02	--	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
H_2S Annual Emissions		5.57E-03	0.03	0.04	--	tpy	H_2S Emissions (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
SO_2 Hourly Emissions		16.90	38.03	38.03	--	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		10.46	57.16	80.81	--	tpy	SO_2 (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
Uncaptured Emissions		DOCK-2, DOCK-4, DOCK-5			DOCK-2LO, DOCK-4LO, DOCK-5LO		
VOC Hourly Emissions	Per Dock	11.87	9.13	9.13	3.40	lb/hr	VOC Hourly Emissions (per dock) (lb/hr) = Maximum Hourly Loading loss (per dock) (lb/hr) * (1 - CE (%))
VOC Annual Emissions		16.52	16.63	16.63	1.96		VOC Annual Emissions (per dock) (tpy) = Maximum Hourly Loading loss (per dock) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		4.41E-03	9.91E-03	9.91E-03	--	lb/hr	H_2S Hourly Emission (per dock) (lb/hr) = VOC Hourly Emissions (per dock) (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		6.13E-03	0.02	0.02	--		H_2S Annual Emission (per dock) (tpy) = VOC Annual Emissions (per dock) (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
VOC Hourly Emissions	Total (DOCK CAP)	26.70	20.54	20.54	10.20	lb/hr	VOC Hourly Emissions (total) (lb/hr) = Maximum Hourly Loading loss (total) (lb/hr) * (1 - CE (%))
VOC Annual Emissions		16.52	30.87	43.63	1.96	tpy	VOC Annual Emissions (total) (tpy) = Maximum Hourly Loading loss (total) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		9.91E-03	0.02	0.02	--	lb/hr	H_2S Hourly Emission (total) (lb/hr) = VOC Hourly Emissions (total) (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		6.13E-03	0.03	0.05	--	tpy	H_2S Annual Emission (total) (tpy) = VOC Annual Emissions (total) (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
Heat Content of Vapor							
Heat Content of Vapor		20,007	19,580	19,580	--	Btu/lb	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
Hourly Heat Rate to VCU	Per VCU	80.84	60.86	60.86	--	MMBtu/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		586,298	443,510	443,510	--	MMBtu/yr	Annual loading loss (per VCU) (tpy) x 2,000 (lb/ton) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Hourly Heat Rate to VCU	Total	485.05	365.15	365.15	--	MMBtu/hr	Maximum hourly loading loss (total) (lb/hr) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		600,112	1,097,718	1,551,678	--	MMBtu/yr	Annual loading loss (total) (tpy) x 2,000 (lb/ton) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
H_2S Emission Calculation Parameters							
VOC K Value		0.7483	0.7483	0.7483	--	Dimensionless	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value		19.628	19.628	19.628	--	Dimensionless	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
Liquid MW		92	207	207	--	lb/lb-mol	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, for Midcontinent Crude Oil and condensate is Motor Gasoline.
H_2S Liquid/Vap MW		34.08	34.08	34.08	--	lb/lb-mol	Standard References
Liquid Mole Fraction H_2S		0.00003	0.0001	0.0001	--		Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S		0.0005	0.0012	0.0012	--		Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC		0.7483	0.7483	0.7483	--		Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor		0.0004	0.0011	0.0011	--	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Table E-3
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC

= Inputs

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 180,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.
Emissions Summary

EPN	FIN	Description	Pollutant	Emission Factor (lb/MMBtu)	Emission Rates (lb/hr)	Emission Rates (tpy)	Information Source
VCU-1 to VCU-3, VCU-5 to VCU-8	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	--	4.04	25.98	Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.100	8.08	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.050	--	25.75	
			CO (max)	0.025	2.02	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.010	--	5.15	
			$PM/PM_{10}/PM_{2.5}$	0.0075	0.60	3.84	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	--	6.34	33.31	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	3.38E-03	0.02	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
VCUCAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	--	24.24	43.03	Maximum of 3 vessels can be loaded per hour. Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.100	48.51	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.050	--	42.45	
			CO (max)	0.025	12.13	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.010	--	8.49	
			$PM/PM_{10}/PM_{2.5}$	0.0075	3.61	6.33	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	--	38.03	80.81	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	0.02	0.04	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2, DOCK-4, DOCK-5	DOCK-2, DOCK-4, DOCK-5	High VP product loading fugitives	VOC	--	11.87	33.14	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	9.91E-03	0.02	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2LO, DOCK-4LO, DOCK-5LO	DOCK-2LO, DOCK-4LO, DOCK-5LO	Low VP product loading fugitives	VOC	--	3.40	1.96	Short-term: Uncaptured VOC Emissions, per dock. Annual: Uncaptured VOC Emissions, per dock.
DOCK CAP	DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO	High and low VP product loading fugitives	VOC	--	26.70	49.34	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, total from crude, condensate, and bunker oil. Annual: [Maximum of uncaptured emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario] + Bunker oil loading emissions.
			H_2S	--	0.02	0.05	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.

Conversions:

42 gal/bbl
2,000 lb/ton

Table E-4
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC

[ ] = Inputs

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Parameter	Basis	Value						Units	Information Source
		Ship/Ocean-Going Barge Loading		Inland Barge Loading	Ship/Ocean-Going Barge Loading	Inland Barge Loading	Inland Barge Loading		
		Crude and Condensate			Crude Only		Bunker Oil		
Product Loaded		Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Bunker Oil		
Maximum Hourly Loading Rate	Per Dock	--	--	5,000	--	5,000	5,000	barrels/hr	Maximum loading rate for inland barges is per dock.
Number of Simultaneous Vessels Loaded	Per Dock	--	--	3	--	3	3		One inland barge loaded per dock.
Maximum Annual Throughput	Per Dock	218,992,000	350,400,000	50,000,000	350,400,000	20,000,000	2,880,000	barrels/yr	Maximum annual barge loading is 50,000,000 bbl/yr. For condensate, the remaining ship/ocean-going barge annual loading volume is the total annual condensate volume through the site, less the maximum annual barge loading rate. For the crude only scenario, ship/ocean-going barge loading is the total annual volume through the site, less the maximum annual barge loading rate. Bunker oil annual throughput is equivalent to 1 turnover per tank, per month (3 tanks x 12 months x 80,000 bbl). Per-dock annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual dock.
Maximum Hourly Capacity	Per VCU	--	--	15,000	--	15,000	--	barrels/hr	Minimum of: 1. maximum VCU capacity (30,000 bbl/hr) and 2. maximum hourly loading rate (per dock) × number of simultaneous vessels loaded.
Maximum Annual Capacity	Per VCU	218,992,000	262,800,000	50,000,000	262,800,000	20,000,000	--	barrels/yr	Minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly capacity (per VCU) × 8,760 hr/yr. The value for condensate is the total barrels of condensate that can be loaded annually. The crude throughput in the crude and condensate loading scenario is the difference between the maximum hourly capacity (per VCU) × 8,760 hr/yr and annual condensate loading. Per-VCU annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual VCU.
Maximum Hourly Loading Rate	Total	--	--	15,000	--	15,000	15,000	barrels/hr	Maximum hourly loading rate (per dock) × Number of simultaneous vessels loaded
Maximum Annual Throughput	Total	218,992,000	650,448,000	50,000,000	899,440,000	20,000,000	2,880,000	barrels/yr	Annual condensate throughput is limited to 12 of the 467k bbl tanks tanks in condensate service. In the crude and condensate service scenario, crude throughput is the total tanks' throughput less the condensate throughput. In the crude only scenario, the throughput assumes that all of the tanks' throughput could be crude. Bunker oil total throughput is equal to the maximum throughput per dock. Per-dock annual throughput is intended for establishing the annual MVCU emissions cap only and is not intended to be an enforceable limit on any individual dock.
Hydrogen Sulfide Content		10	10	10	10	10	--	ppmw	
Saturation Factor (S)		0.2	0.2	0.5	0.2	0.5	0.5		Saturation factor obtained for submerged loading: barges and ships obtained from U.S. EPA AP-42 Chapter 5, Section 5.2 Transportation and Marketing of Petroleum Liquids (July 2008), Table 5.2-1.
Physical Properties									
Maximum True Vapor Pressure (P_{max}) [1]		11.00	11.00	11.00	11.00	11.00	0.06	psia	Condensate: P_{ave} calculated using Figure 7.1-14b from AP-42 Section 7.1 (Jun 2020). RVP = 13.5, T = 70°F. Crude: P_{ave} calculated using Figure 7.1-13b from AP-42 Section 7.1 (Jun 2020). RVP = 10, T = 70°F.
Average True Vapor Pressure (P_{ave})		8.70	8.74	8.70	8.74	8.74	0.06	psia	Maximum TVP is limited to 11.00 psia. Bunker Oil: TVP is based on SDS data.
Vapor Molecular Weight (M)		65	50	65	50	50	130	lb/lb-mole	MW values obtained from U.S. EPA AP-42, Chapter 7.1 (Jun 2020), Table 7.1-2, for Crude Oil (RVP 5), condensate is Motor Gasoline and bunker oil is No. 6 Fuel Oil.
Maximum Loading Temperature (T_{max})		95	95	95	95	95	120	deg. F	Bunker oil is heated to 120°F.
		555	555	555	555	555	580	deg. R	
Average Loading Temperature (T_{ave})		70	70	70	70	70	120	deg. F	
		530	530	530	530	530	580	deg. R	
Uncontrolled Loading Loss									
VOC Emission Factor at Maximum Loading Temp. (LLmax)		3.21	2.47	8.03	2.47	6.17	0.08	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLmax = 12.46 x S x P_{max} x M / T_{max}
VOC Emission Factor at Average Loading Temp. (LLave)		2.66	2.05	6.64	2.05	5.14	0.08	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLavg = 12.46 x S x P_{avg} x M / T_{avg}
Maximum Hourly Loading Loss	Per Dock	--	--	1,685	--	1,297	17.01	lb/hr	Maximum hourly throughput (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per Dock	12,223	15,117	6,977	15,117	2,157	4.90	tpy	Maximum annual throughput (per dock) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Per VCU	--	--	5,056	--	3,890	--	lb/hr	Maximum hourly capacity (per VCU) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per VCU	12,223	11,338	6,977	11,338	2,157	--	tpy	Maximum annual capacity (per VCU) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Total	--	--	5,056	--	3,890	51.02	lb/hr	Maximum hourly throughput (bbl/hr) x Number of Simultaneous Vessels Loaded x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Total	12,223	28,062	6,977	38,805	2,157	4.90	tpy	Maximum annual throughput (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Vapor Collection System									
Collection Efficiency		99.89%	99.89%	100%	99.89%	100%	--	%	Vapor collection efficiency (CE)
Vapor Combustion (EPNs VCU-1 to VCU-3, VCU-5 to VCU-8)									
Destruction Removal Efficiency (DRE)		99.9%	99.9%	99.9%	99.9%	99.9%	--	%	Destruction Removal Efficiency (DRE)

Table E-4
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC

= Inputs

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Parameter	Basis	Value						Units	Information Source
		Ship/Ocean-Going Barge Loading		Inland Barge Loading	Ship/Ocean-Going Barge Loading	Inland Barge Loading			
		Crude and Condensate			Crude Only		Bunker Oil		
Product Loaded		Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Bunker Oil		
Uncombusted Loading Emissions (EPNs VCU-1 to VCU-3, VCU-5 to VCU-8)									
VOC Hourly Emissions	Per VCU (VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8 [hourly only])	--	--	5.06	--	3.89	--	lb/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE (%)) x (1 - DRE %)
VOC Annual Emissions		12.21	11.33	6.98	11.33	2.16	--	tpy	Annual loading loss (per VCU) (tpy) x (CE (%)) x (1 - DRE %)
H_2S Hourly Emissions		--	--	1.88E-03	--	4.22E-03	--	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
H_2S Annual Emissions		4.53E-03	0.01	2.59E-03	0.01	2.34E-03	--	tpy	H_2S Emissions (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
SO_2 Hourly Emissions		--	--	3.53	--	7.93	--	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		8.51	23.10	4.86	23.10	4.40	--	tpy	SO_2 (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
VOC Hourly Emissions	Total (VCUCAP)	--	--	5.06	--	3.89	--	lb/hr	Maximum hourly loading loss (total) (lb/hr) x (CE (%)) x (1 - DRE %) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		12.21	28.03	6.98	38.76	2.16	--	tpy	Annual loading loss (total) (tpy) x (CE (%)) x (1 - DRE %) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		--	--	1.88E-03	--	4.22E-03	--	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
H_2S Annual Emissions		4.53E-03	0.03	2.59E-03	0.04	2.34E-03	--	tpy	H_2S Emissions (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE %)
SO_2 Hourly Emissions		--	--	3.53	--	7.93	--	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		8.51	57.16	4.86	79.05	4.40	--	tpy	SO_2 (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
Uncaptured Emissions		DOCK-2, DOCK-4, DOCK-5		No Emissions	DOCK-2, DOCK-4, DOCK-5	No Emissions	DOCK-2LO, DOCK-4LO, DOCK-5LO		
VOC Hourly Emissions	Per Dock	--	--	--	--	--	17.01	lb/hr	
VOC Annual Emissions		13.45	16.63	--	16.63	--	4.90	tpy	VOC Annual Emissions (per dock) (tpy) = Maximum Hourly Loading loss (per dock) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		--	--	--	--	--	--	lb/hr	
H_2S Annual Emissions		4.99E-03	0.02	--	0.02	--	--	tpy	H_2S Annual Emission (per dock) (tpy) = VOC Annual Emissions (per dock) (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
VOC Hourly Emissions	Total (DOCK CAP)	--	--	--	--	--	51.02	lb/hr	VOC Hourly Emissions (lb/hr) = Maximum Hourly Loading loss (lb/hr) * (1 - CE (%))
VOC Annual Emissions		13.45	30.87	--	42.69	--	4.90	tpy	VOC Annual Emissions (tpy) = Maximum Hourly Loading loss (tpy) * (1 - CE (%))
H_2S Hourly Emissions		--	--	--	--	--	--	lb/hr	H_2S Hourly Emission (lb/hr) = VOC Hourly Emissions (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		4.99E-03	0.03	--	0.05	--	--	tpy	H_2S Annual Emission (tpy) = VOC Annual Emissions (lb/hr) x (1 - CE (%)) x H_2S Emission Factor (lb H_2S/lb VOC)
Heat Content of Vapor									
Heat Content of Vapor		20,007	19,580	20,007	19,580	19,580	--	Btu/lb	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
Hourly Heat Rate to VCU	Per VCU	--	--	1.01	--	0.76	--	MMBtu/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		488,564	443,510	279,178	443,510	84,475	--	MMBtu/yr	Annual loading loss (per VCU) (tpy) x 2,000 (lb/ton) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Hourly Heat Rate to VCU	Total	--	--	1.01	--	0.76	--	MMBtu/hr	Maximum hourly loading loss (lb/hr) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		488,564	1,097,718	279,178	1,517,925	84,475	--	MMBtu/yr	Annual loading loss (tpy) x 2,000 (lb/ton) x (CE %) x Heat content of VOC (Btu/lb) / 1,000,000
H_2S Emission Calculation Parameters									
VOC K Value		0.7483	0.7483	0.7483	0.7483	0.7483	--	Dimensionless	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value		19.628	19.628	19.628	19.628	19.628	--	Dimensionless	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
Liquid MW		92	207	92	207	207	--	lb/lb-mol	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, for Midcontinent Crude Oil and condensate is Motor Gasoline.
H_2S Liquid/Vap MW		34.08	34.08	34.08	34.08	34.08	--	lb/lb-mol	Standard References
Liquid Mole Fraction H_2S		0.00003	0.0001	0.00003	0.0001	0.0001	--		Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S		0.0005	0.0012	0.0005	0.0012	0.0012	--		Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC		0.7483	0.7483	0.7483	0.7483	0.7483	--		Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor		0.0004	0.0011	0.0004	0.0011	0.0011	--	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Table E-4
Marine Loading Emission Calculations (EPNs: DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7, VCU-8)
Moda Ingleside Energy Center
Moda Ingleside, LLC

= Inputs

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput from up to 12 of its largest tanks; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Emissions Summary

EPN	FIN	Description	Pollutant	Emission Factor	Emission Rates		Information Source
				(lb/MMBtu)	(lb/hr) [2], [3]	(tpy) [4]	
VCU-1 to VCU-3, VCU-5 to VCU-8	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	--	5.06	30.51	Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.100	0.10	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.050	--	30.28	
			CO (max)	0.025	0.03	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.010	--	6.06	
			$PM/PM_{10}/PM_{2.5}$	0.0075	7.54E-03	4.51	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	--	7.93	36.47	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	4.22E-03	0.02	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
VCUCAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	--	5.06	47.22	Maximum of 3 vessels can be loaded per hour. Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.100	0.10	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.050	--	46.64	
			CO (max)	0.025	0.03	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.010	--	9.33	
			$PM/PM_{10}/PM_{2.5}$	0.0075	7.54E-03	6.95	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	--	7.93	83.45	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	4.22E-03	0.04	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2, DOCK-4, DOCK-5	DOCK-2, DOCK-4, DOCK-5	High VP product loading fugitives	VOC	--	--	30.07	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	--	0.02	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2LO, DOCK-4LO, DOCK-5LO	DOCK-2LO, DOCK-4LO, DOCK-5LO	Low VP product loading fugitives	VOC	--	17.01	4.90	Short-term: Uncaptured VOC Emissions, per dock. Annual: Uncaptured VOC Emissions, per dock.
DOCK CAP	DOCK-2, DOCK-2LO, DOCK-4, DOCK-4LO, DOCK-5, DOCK-5LO	High and low VP product loading fugitives	VOC	--	51.02	49.21	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, total from crude, condensate, and bunker oil. Annual: [Maximum of uncaptured emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario] + Bunker oil loading emissions.
			H_2S	--	--	0.05	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.

Conversions:

42 gal/bbl
2,000 lb/ton

Table E-5
VCU Pilot Emissions (EPNs: VCU-1, VCU-2, VCU-3, VCU-4, VCU-5, VCU-6, VCU-7, VCU-8, PORTVC, and MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside, LLC

EPNs VCU-1 through VCU-8

Natural Gas Flow Rate	130	scf/hr-pilot
Number of Pilots per VCU	3	
Number of VCUs	8	

Pollutant [1],[2]	Emission Factor		Total Flow Rate	Emissions per VCU	
	Value	Units	scf/hr	lb/hr [3]	tons/year [4]
VOC	5.5	lb/10^6 scf	390	2.15E-03	9.40E-03
NO_X	100	lb/10^6 scf	390	0.04	0.17
CO	84	lb/10^6 scf	390	0.03	0.14
SO_2	0.6	lb/10^6 scf	390	2.34E-04	1.02E-03
$PM/PM_{10}/PM_{2.5}$	7.6	lb/10^6 scf	390	2.96E-03	0.01

VCUCAP Emissions

Pollutant	Maximum Short-term Emissions	Annual Emissions
	lb/hr	tons/year
VOC	0.02	0.08
NO_X	0.31	1.37
CO	0.26	1.15
SO_2	1.87E-03	8.20E-03
$PM/PM_{10}/PM_{2.5}$	0.02	0.10

EPNs PORTVC and MSS-CONT

Propane Flow Rate	1	gal/hr-pilot
Number of Pilots	3	

Pollutant [5]	Emission Factor		Total Flow Rate	Emissions	
	Value	Units	gal/hr	lb/hr [6]	tons/year [7]
VOC	1.0	lb/10^3 gal	3	3.00E-03	0.01
NO_X	13	lb/10^3 gal	3	0.04	0.17
CO	7.5	lb/10^3 gal	3	0.02	0.10
SO_2 [8]	0.054	lb/10^3 gal	3	1.62E-04	7.10E-04
$PM/PM_{10}/PM_{2.5}$	0.7	lb/10^3 gal	3	2.10E-03	9.20E-03

Notes:

[1] NO_X and CO factors are from AP-42 Section 1.4, Table 1.4-1, factors for uncontrolled small boilers.

[2] VOC, SO_2, and PM factors from AP-42 Section 1.4, Table 1.4-2. SO_2 factor assumes all sulfur in the fuel is converted to SO_2. Total PM factor is for PM < 1 µm in diameter; therefore, PM = PM_{10} = $PM_{2.5}$.

[3] Calculated according to the following equation: Emission factor (lb/10^6 scf) × 1 MMscf/10^6 scf × Total Flow Rate (scf/hr).

[4] Calculated according to the following equation: Emission factor (lb/10^6 scf) × 1 MMscf/10^6 scf × Total Flow Rate (scf/hr) × 8,760 hrs/year ÷ 2,000 lb/ton.

[5] Criteria pollutant factors are from AP-42 Section 1.5, Table 1.5-1, factors for commercial boilers. SO_2 factor assumes all sulfur in the fuel is converted to SO_2. Used the factor for PM, Total and assumed that PM = PM_{10} = $PM_{2.5}$.

[6] Calculated according to the following equation: Emission factor (lb/10^3 gal) × Total Flow Rate (gal/hr) ÷ 1,000.

[7] Calculated according to the following equation: Emission factor (lb/10^3 gal) × Total Flow Rate (gal/hr) ÷ 1,000 × 8,760 hrs/year ÷ 2,000 lb/ton.

[8] Emission factor is 0.10S, where S is the sulfur content in grains per 100 ft^3 gas vapor. Based on 0.54 gr S/100 scf (Haneke, B., *A National Methodology and Emission Inventory for Residential Fuel Combustion* , https://www3.epa.gov/ttnchie1/conference/ei12/area/haneke.pdf).

Conversions:

2,000 lb/ton
8,760 hrs/year
1,000,000 scf/MMscf

Table E-6

Storage Tank Emissions - Crude Oil (EPNs: T-101 to T-144, T-201, T-202, RT-1, RT-2)

Moda Ingleside Energy Center

Moda Ingleside, LLC

Input Parameters

Parameter	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	Units	Information Source
Tank Type:	IFR	IFR	IFR	IFR	IFR	IFR		
Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202		
Tank Capacity	467,000	373,000	310,000	202,000	12,600	1,000	bbl	
Diameter, D	210	190	210	140	46	21.5	ft	
H_2S Content	50	50	50	50	50	50	ppmw	
Hourly Throughput	40,000	40,000	40,000	40,000	12,600	1,000	bbl/hr-tk	
Annual Throughput	28,020,000	22,380,000	18,600,000	12,120,000	25,200	60,000	bbl/yr-tk	Per tank throughput is intended for establishing the annual tank emissions cap only and is not intended to be an enforceable limit on any individual tank.
Rim Seal Factor, K_R	0.6	0.6	5.8	0.6	0.6	5.8	lb-mole/ft-yr	467k, 373k, 202k, and 12.6k BBL Tanks: Factor for welded tanks with a primary mechanical-shoe seal with a rim-mounted secondary seal, from AP-42 Section 7.1 (Jun 2020), Table 7.1-8. 310k and 1k BBL Tanks: Factor for welded tanks with a primary mechanical-shoe seal only, from AP-42 Section 7.1 (Jun 2020), Table 7.1-8.
Deck Fitting Factor, F_F	264.23	354.48	401.87	230.67	107.04	93.88	lb-mole/yr	Based on as-built tank conditions.
Deck Seam Length Factor, S_D	--	--	--	--	--	--	ft/ft^2	Applies to bolted decks only
Number of Columns, N_C	9	19	22	9	1	0	--	Based on as-built tank conditions.
Column Diameter, F_C	1.0	1.0	1.0	1.0	1.0	1.0	ft	According to Note 3 for AP-42 Section 7.1 (Jun 2020), Eqn. (2-19), F_C = 1.0 if column construction details are not known.
Shell Clingage, C_S	0.006	0.006	0.006	0.006	0.006	0.006	$bbl/1000\ ft^2$	Factor for crude oil in a tank with a light rust shell condition, from AP-42 Section 7.1 (Jun 2020), Table 7.1-10.
Product Factor, K_C	0.40	0.40	0.40	0.40	0.40	0.40	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-2) variables, K_C = 0.4 for crude oils, 1.0 for other organic liquids.
Liquid MW	207	207	207	207	207	207	lb/lb-mole	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Vapor MW	50	50	50	50	50	50	lb/lb-mole	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Max True Vapor Pressure, P_{max}	11.00	11.00	11.00	11.00	11.00	11.00	psia	Storage of crude oil will not exceed 11 psia based on surface liquid temperature inside the storage tank.
Ave True Vapor Pressure, P_{avg}	8.74	8.74	8.74	8.74	8.74	8.74	psia	Calculated using Figure 7.1-13b from AP-42 Section 7.1 (Jun 2020). RVP = 10, T = 70°F.
Vapor Function (Hourly), P*	0.33	0.33	0.33	0.33	0.33	0.33	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-4): $(P_{max}/14.7\ psia)/((1+(1-(P_{max}/14.7\ psia))^{0.5})^2)$
Vapor Function (Annual), P*	0.22	0.22	0.22	0.22	0.22	0.22	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-4): $(P_{avg}/14.7\ psia)/((1+(1-(P_{avg}/14.7\ psia))^{0.5})^2)$
Liquid Density	7.10	7.10	7.10	7.10	7.10	7.10	lb/gal	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Short-term Emissions (lb/hr)								
Rim Seal Loss, L_R	0.10	0.09	0.92	0.06	0.02	0.09	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn (2-3): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Hourly) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Fitting Loss, L_F	0.20	0.27	0.30	0.17	0.08	0.07	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-13): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Hourly) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Seam Loss, L_D	0.00	0.00	0.00	0.00	0.00	0.00	lb/hr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	7.98	9.30	8.45	12.22	11.24	1.87	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-19): [0.943 x Hourly Throughput (bbl/hr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]

Table E-6
Storage Tank Emissions - Crude Oil (EPNs: T-101 to T-144, T-201, T-202, RT-1, RT-2)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Input Parameters

Parameter	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	Units	Information Source
Tank Type:	IFR	IFR	IFR	IFR	IFR	IFR		
Annual Emissions (lb/yr)								
Rim Seal Loss, L_R	559.17	505.91	5,405.26	372.78	122.48	553.40	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-3): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Annual) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Fitting Loss, L_F	1,172.60	1,573.12	1,783.43	1,023.67	475.02	416.62	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-13): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Annual) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Seam Loss, L_D	0.00	0.00	0.00	0.00	0.00	0.00	lb/yr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	5,589.78	5,205.00	3,930.82	3,701.30	22.49	112.11	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-19): [0.943 x Annual Throughput (bbl/yr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]
Maximum Storage Tank Temperature	95	95	95	95	95	95	°F	
Average Storage Tank Temperature	70	70	70	70	70	70	°F	
VOC K Value	0.7483	0.7483	0.7483	0.7483	0.7483	0.7483	--	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value	19.628	19.628	19.628	19.628	19.628	19.628	--	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
H_2S Liquid/Vap MW	34.08	34.08	34.08	34.08	34.08	34.08	lb/lb-mole	Standard References
Liquid Mole Fraction H_2S	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	Conversion	Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC	0.7483	0.7483	0.7483	0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor	0.0054	0.0054	0.0054	0.0054	0.0054	0.0054	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Storage Tank Emission Calculations

EPN	Description	VOC [1]		H_2S [2]	
		lb/hr	tpy	lb/hr	tpy
T-103, T-106, T-109 through T-121, T-124, T-125, and T-127 through T-144	467,000-bbl Tanks	8.28	3.66	0.04	0.02
T-122 and T-123	373,000-bbl Tanks	9.66	3.64	0.05	0.02
T-101, T-102, T-104, T-105, T-107, T-108	310,000-bbl Tanks	9.68	5.56	0.05	0.03
T-126	202,000-bbl Tanks	12.45	2.55	0.07	0.01
RT-1, RT-2	Emergency Relief Tanks	11.34	0.31	0.06	1.68E-03
T-201 and T-202	1,000-bbl Tanks	2.03	0.54	0.01	2.94E-03

Notes:

[1] VOC Emission (lb/hr) = Rim Seal Loss, L_R (lb/hr) + Deck Fitting Loss, L_F (lb/hr) + Deck Seam Loss, L_D (lb/hr) + Withdrawal Loss, L_{WD} (lb/hr)
VOC Emission (tpy) = [Rim Seal Loss, L_R (lb/yr) + Deck Fitting Loss, L_F (lb/yr) + Deck Seam Loss, L_D (lb/yr) + Withdrawal Loss, L_{WD} (lb/yr)] * 1 ton / 2,000 lb

[2] H_2S Emissions (lb/hr) = VOC emissions (lb/hr) * H_2S Emission Factor (lb H_2S / lb VOC)
H_2S Emissions (tpy) = VOC emissions (tpy) * H_2S Emission Factor (lb H_2S / lb VOC)

Table E-7

Storage Tank Emissions - Condensate (EPNs: T-103, T-106, T-109 to T-144)

Moda Ingleside Energy Center

Moda Ingleside, LLC

Input Parameters

Parameter	467k BBL	373k BBL	202k BBL	Units	Information Source
Tank Type:	IFR	IFR	IFR		
Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126		
Tank Capacity	467,000	373,000	202,000	bbl	
Diameter, D	210	190	140	ft	
H_2S Content	50	50	50	ppmw	
Hourly Throughput	40,000	40,000	40,000	bbl/hr-tk	
Annual Throughput	28,020,000	22,380,000	12,120,000	bbl/yr-tk	Per tank throughput is intended for establishing the annual tank emissions cap only and is not intended to be an enforceable limit on any individual tank.
Rim Seal Factor, K_R	0.6	0.6	0.6	lb-mole/ft-yr	Factor for welded tanks with a primary mechanical-shoe seal with a rim-mounted secondary seal, from AP-42 Section 7.1 (Jun 2020), Table 7.1-8.
Deck Fitting Factor, F_F	264.23	354.48	230.67	lb-mole/yr	Based on as-built tank conditions.
Deck Seam Length Factor, S_D	--	--	--	ft/ft^2	Applies to bolted decks only
Number of Columns, N_C	9	19	9	--	Based on as-built tank conditions.
Column Diameter, F_C	1.0	1.0	1.0	ft	According to Note 3 for AP-42 Section 7.1 (Jun 2020), Eqn. (2-19), F_C = 1.0 if column construction details are not known.
Shell Clingage, C_S	0.0015	0.0015	0.0015	$bbl/1,000\ ft^2$	Factor for gasoline in a tank with a light rust shell condition, from AP-42 Section 7.1 (Jun 2020), Table 7.1-10.
Product Factor, K_C	1.00	1.00	1.00	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-2) variables, K_C = 0.4 for crude oils, 1.0 for other organic liquids.
Liquid MW	92	92	92	lb/lb-mole	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for all Motor Gasolines.
Vapor MW	65	65	65	lb/lb-mole	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, interpolated for Motor Gasoline (RVP 11).
Max True Vapor Pressure, P_{max}	11.00	11.00	11.00	psia	Storage of condensate will not exceed 11 psia based on surface liquid temperature inside the storage tank.
Avg True Vapor Pressure, P_{avg}	8.70	8.70	8.70	psia	Calculated using Figure 7.1-14b from AP-42 Section 7.1 (Jun 2020). RVP = 13.5, T = 70F.
Vapor Function (Hourly), P*	0.33	0.33	0.33	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-4): $(P_{max}/14.7\ psia)/((1+(1-(P_{max}/14.7\ psia))^{0.5})^2)$
Vapor Function (Annual), P*	0.22	0.22	0.22	--	AP-42 Section 7.1 (Jun 2020), Eqn. (2-4): $(P_{avg}/14.7\ psia)/((1+(1-(P_{avg}/14.7\ psia))^{0.5})^2)$
Liquid Density	5.60	5.60	5.60	lb/gal	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for all Motor Gasolines.
Short-term Emissions (lb/hr)					
Rim Seal Loss, L_R	0.31	0.28	0.21	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn (2-3): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Hourly) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Fitting Loss, L_F	0.65	0.87	0.57	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-13): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Hourly) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Seam Loss, L_D	0.00	0.00	0.00	lb/hr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	1.57	1.83	2.41	lb/hr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-19): [0.943 x Hourly Throughput (bbl/hr) x Liquid Density (lb/gal) x Shell Clingage (C_S, $bbl/1,000\ ft^2$) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]

Table E-7
Storage Tank Emissions - Condensate (EPNs: T-103, T-106, T-109 to T-144)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Input Parameters

Parameter	467k BBL	373k BBL	202k BBL	Units	Information Source
Tank Type:	IFR	IFR	IFR		
Annual Emissions (lb/yr)					
Rim Seal Loss, L_R	1,803.58	1,631.81	1,202.39	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-3): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Annual) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Fitting Loss, L_F	3,782.22	5,074.07	3,301.84	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-13): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Annual) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Seam Loss, L_D	0.00	0.00	0.00	lb/yr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	1,102.21	1,026.34	729.83	lb/yr	AP-42 Section 7.1 (Jun 2020), Eqn. (2-19): [0.943 x Annual Throughput (bbl/yr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]
Maximum Storage Tank Temperature	95	95	95	°F	
Average Storage Tank Temperature	70.0	70.0	70.0	°F	
VOC K Value	0.7483	0.7483	0.7483	--	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value	19.628	19.628	19.628	--	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
H_2S Liquid/Vap MW	34.08	34.08	34.08	lb/lb-mole	Standard References
Liquid Mole Fraction H_2S	0.0001	0.0001	0.0001	Conversion	Liquid weight concentration x Condensate liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S	0.0026	0.0026	0.0026	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC	0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor	0.0019	0.0019	0.0019	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Storage Tank Emission Calculations

EPN	Description	VOC [1]		H_2S [2]	
		lb/hr	tpy	lb/hr	tpy
T-103, T-106, T-109 through T-121, T-124, T 125, and T-127 through T-144	467,000-bbl Tanks	2.53	3.34	4.70E-03	6.21E-03
T-122 and T-123	373,000-bbl Tanks	2.99	3.87	5.55E-03	7.18E-03
T-126	202,000-bbl Tanks	3.18	2.62	5.91E-03	4.86E-03

Notes:

[1] VOC Emission (lb/hr) = Rim Seal Loss, L_R (lb/hr) + Deck fitting Loss, L_F (lb/hr) + Deck Seam Loss, L_D (lb/hr) + Withdrawal Loss, L_{WD} (lb/hr)
VOC Emission (tpy) = [Rim Seal Loss, L_R (lb/yr) + Deck fitting Loss, L_F (lb/yr) + Deck Seam Loss, L_D (lb/yr) + Withdrawal Loss, L_{WD} (lb/yr)] * 1 ton / 2,000 lb

[2] H_2S Emissions (lb/hr) = VOC emissions (lb/hr) * H_2S Emission Factor (lb H_2S / lb VOC)
H_2S Emissions (tpy) = VOC emissions (tpy) * H_2S Emission Factor (lb H_2S / lb VOC)

Table E-8

Equipment Leak Fugitive Emissions (EPN: FUG)

Moda Ingleside Energy Center

Moda Ingleside, LLC

Fugitives Currently Authorized in Permit 122362

EPN: FUG							
Component	**Quantity**	**Stream Type [1]**	**Emission Factor [2] (lb/component-hr)**	**LDAR Program [3]**	**Control Efficiency**	**Emissions [4] (lb/hour)**	**Emissions [5] (tpy)**
Valves	5,237	Light Liquid	0.0055	28VHP	97%	0.86	3.78
	1,008	Gas/Vapor	0.00992	28VHP	97%	0.30	1.31
Pumps	144	Light Liquid	0.02866	28VHP	85%	0.62	2.71
Flanges	15,885	Light Liquid	0.000243	28VHP + 28CNTQ	97%	0.12	0.51
	3,024	Gas/Vapor	0.00086	28VHP + 28CNTQ	97%	0.08	0.34
Compressors	15	Gas/Vapor	0.0194	28VHP	85%	0.04	0.19
Relief Valves	263	Light Liquid	0.0165	28VHP	100%	--	--
	23	Gas/Vapor	0.0194	28VHP	97%	0.01	0.06
Total Fugitive VOC Losses						**2.03**	**8.91**
Maximum H_2S factor (lb H_2S/lb VOC, based on 50 ppmw H_2S content)						**5.43E-03**	**5.43E-03**
Fugitive H_2S Losses [6]						**0.01**	**0.05**

Bunker Oil Tank Fugitives from PBR 159913

Component	**Quantity**	**Stream Type [1]**	**Emission Factor [7] (lb/component-hr)**	**LDAR Program [3]**	**Control Efficiency**	**Emissions [4] (lb/hour)**	**Emissions [5] (tpy)**
Valves	245	Heavy Liquid	0.0007	28VHP	0%	0.17	0.75
	54	Gas/Vapor	0.0089	28VHP	97%	0.01	0.06
Pumps	7	Heavy Liquid	0.0161	28VHP	0%	0.11	0.49
Flanges	734	Heavy Liquid	0.00007	28VHP + 28CNTQ	30%	0.04	0.16
	160	Gas/Vapor	0.0029	28VHP + 28CNTQ	97%	0.01	0.06
Compressors	1	Gas/Vapor	0.5027	28VHP	85%	0.08	0.33
Relief Valves	14	Heavy Liquid	0.0007	28VHP	100%	--	--
	2	Gas/Vapor	0.2293	28VHP	97%	0.01	0.06
Total Fugitive VOC Losses						**0.44**	**1.92**

Bunker Oil Marine Loading Fugitives from PBR 159913

Component	**Quantity**	**Stream Type [1]**	**Emission Factor [7] (lb/component-hr)**	**LDAR Program [3]**	**Control Efficiency**	**Emissions [4] (lb/hour)**	**Emissions [5],[8] (tpy)**
Valves	31	Heavy Liquid	0.0007	28VHP	0%	0.02	0.02
	7	Gas/Vapor	0.0089	28VHP	97%	1.87E-03	2.05E-03
Pumps	1	Heavy Liquid	0.0161	28VHP	0%	0.02	0.02
Flanges	93	Heavy Liquid	0.00007	28VHP + 28CNTQ	30%	4.56E-03	4.99E-03
	20	Gas/Vapor	0.0029	28VHP + 28CNTQ	97%	1.74E-03	1.91E-03
Relief Valves	2	Heavy Liquid	0.0007	28VHP	100%	--	--
Total Fugitive VOC Losses						**0.05**	**0.05**

Total Fugitives

EPN: FUG							
Component	**Quantity**	**Stream Type [1]**	**Emission Factor (lb/component-hr)**	**LDAR Program [3]**	**Control Efficiency**	**Emissions [9] (lb/hour)**	**Emissions [9] (tpy)**
Valves	5,237	Light Liquid	--	28VHP	97%	0.86	3.78
	276	Heavy Liquid	--	28VHP	0%	0.19	0.77
	1,069	Gas/Vapor	--	28VHP	97%	0.32	1.38
Pumps	144	Light Liquid	--	28VHP	85%	0.62	2.71
	8	Heavy Liquid	--	28VHP	0%	0.13	0.51
Flanges	15,885	Light Liquid	--	28VHP + 28CNTQ	97%	0.12	0.51
	827	Heavy Liquid	--	28VHP + 28CNTQ	30%	0.04	0.16
	3,204	Gas/Vapor	--	28VHP + 28CNTQ	97%	0.09	0.40
Compressors	16	Gas/Vapor	--	28VHP	85%	0.12	0.52
Relief Valves	263	Light Liquid	--	28VHP	100%	--	--
	16	Heavy Liquid	--	28VHP	100%	--	--
	25	Gas/Vapor	--	28VHP	97%	0.03	0.12
Total Fugitive VOC Losses						**2.52**	**10.88**
Maximum H_2S factor (lb H_2S/lb VOC, based on 50 ppmw H_2S content)						**5.43E-03**	**5.43E-03**
Fugitive H_2S Losses [10]						**0.01**	**0.05**

Notes:

[1] Light liquids are those with a vapor pressure > 0.044 psia at 68°F, according to TCEQ Air Permit Technical Guidance for Chemical Sources Fugitive Guidance (APDG 6422v2, Jun 2018), pg. 3 of 33. Heavy liquids are those with a vapor pressure < 0.044 psia at 68°F

[2] Oil & Gas Production Operation fugitive emission factors were obtained from Table II from the TCEQ Air Permit Technical Guidance fo Chemical Sources: Fugitive Guidance (APDG 6422v2, Jun 2018). Factors for "Light Oil" are used for light liquid. Factors for "Gas" are usec for gas/vapor.

[3] The Ingleside Terminal has uncontrolled fugitive emissions greater than 25 tons per year and according to TCEQ BACT, must use the 28VHP LDAR Program to monitor its equipment leak fugitives. The terminal also uses the 28CNTQ monitoring program on its flanges and connectors.

[4] Emissions are calculated according to the following equation

$$No.of\ components\ \times Emission\ Factor\ (lb/component - hr) \times (1 - Control\ Efficiency)$$

[5] Emissions are calculated according to the following equation

$$Short - term\ Emissions\ (lb/hr) \times Conversion\ (8{,}760\ hr/yr) \div Conversion\ (2{,}000\ lb/ton)$$

[6] H_2S content is based on the maximum vapor content in any product. Emissions are calculated according to the following equation:

$$Emissions\ (lb/hr\ or\ tons/year) \times H_2S\ Emission\ Factor\ \left(\frac{lb\ H_2S}{lb\ VOC}\ or\ \frac{ton\ H_2S}{ton\ VOC}\right)$$

[7] SOCMI Without Ethylene fugitive emission factors were obtained from Table I from the TCEQ Air Permit Technical Guidance for Chemica Sources: Fugitive Guidance (APDG 6422v2, Jun 2018).

[8] For bunker oil dock fugitives, annual emissions account for maximum operating time of approximately 25% of the year

Table E-9
Storage Tank Roof Landing Emissions (EPNs: VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

		Drain-Dry	Product Change Landings					Degassing						
		Tank Size:	467k BBL	373k BBL	310k BBL	202k BBL	1k BBL	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	
Parameter	Variable	Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	T-201, T-202	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202	Information Source
		Product:	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Diameter	D	ft	210	190	210	140	21.5	210	190	210	140	46.0	21.5	
Landed Roof Height	h_v	ft	3.17	3.17	3.17	3.17	3.17	4.33	4.33	4.33	4.33	4.33	4.33	The roof height for product change landings corresponds to the highest critical zone height of all tanks (3 feet, 2 inches). The roof height for degassing corresponds to the highest roof float height of all tanks (4 feet, 4 inches).
Total Volume under Floating Roof	V_V	ft^3	109,680.85	89,784.10	109,680.85	48,747.05	1,149.66	150,089.59	122,862.45	150,089.59	66,706.48	7,201.58	1,573.22	Equation (1-3, using h_V): $h_V \pi D^2/4$
Hours/Day	n_d	dimensionless	24	24	24	24	24	24	24	24	24	24	24	
Maximum Standing Idle Duration	T_{stand}	hours/event	24	24	24	24	24	24	24	24	24	24	24	
Refilling Rate		bbl/hr	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	
Refilling Duration	T_{fill}	hours/event	3.91	3.20	3.91	1.74	0.04	5.35	4.38	5.35	2.38	0.26	0.06	$T_{fill} = V_V$ (ft^3) ÷ Conversion (ft^3/bbl) ÷ Refilling Rate (bbl/hr)
Controlled Roof Landing Episodes/Year/Tank	n_d	dimensionless	2	2	2	2	2	1	1	1	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	6	0	0	4	0	6	0	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	0	1	2	31	2	0	1	2	2	
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-19.
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
MW Liquid	M_L	lb/lb-mole	207	207	207	207	207	207	207	207	207	207	207	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
MW Vapor	M_V	lb/lb-mole	50	50	50	50	50	50	50	50	50	50	50	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
MW H_2S	-	lb/lb-mole	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	Liquid and vapor MW of H_2S
Liquid Density	W_L	lb/gal	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Liquid Mole Fraction H_2S	X_{H2S}	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	X_{H2S} = Liquid H_2S Conc (ppmw) ÷ 1,000,000 parts/million parts × MW Crude Liquid (lb/lb-mole) ÷ MW H_2S (lb/lb-mole)
Liquid Mole Fraction VOC	X_{VOC}	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	Conservatively assumes that the liquid is all VOC.
H_2S K Value	K_{H2S}	-	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	Calculated using Figure 7.1-13b from AP-42 Section 7.1 (Jun 2020). RVP = 10, T = 70°F.
VOC K Value	K_{VOC}	-	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	$K_{VOC} = P_{VA} \div 14.7$ psia
Vapor Mole Fraction H_2S	Y_{H2S}	-	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	$Y_{H2S} = X_{H2S} \times K_{H2S}$
Vapor Mole Fraction VOC	Y_{VOC}	-	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	$Y_{VOC} = X_{VOC} \times K_{VOC}$
Wt. Fraction H_2S in VOC	Z_{H2S}	-	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	$Z_{H2S} = Y_{H2S} \div Y_{VOC}$ ÷ MW Crude Vapor (lb/lb-mole) × MW H_2S (lb/lb-mole)
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	Z_{H2S} as a percentage
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Clingage Factor	C_S	bbl/1,000 ft^2	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	AP-42 Section 7.1 (Jun 2020), Table 7.1-10, factor for crude oil, gunite lining shell condition.
Controlled Standing Idle Losses (EPNs: VCU-4 and PORTVC)														
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	64.96	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1 (Jun 2020), Eqn. (3-11): $L_{SL} = 0.042*C_S*W_L*(\pi*D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	$L_{SL,max}$	lbs	5,059.60	4,141.76	5,059.60	2,248.71	53.03	6,923.66	5,667.67	6,923.66	3,077.18	332.21	72.57	AP-42 Section 7.1 (Jun 2020), Eqn. (3-14): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	5,059.60	4,141.76	5,059.60	2,248.71	53.03	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1 (Jun 2020), Eqn. (3-15): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Controlled VOC Standing Idle Losses/Tank	L_{SL}	lbs	5.06	4.14	5.06	2.25	0.05	6.20	5.07	6.20	2.75	0.30	0.06	Total Uncontrolled VOC Standing Idle Losses (lbs) × (1 - DRE %)
Total Controlled H_2S Standing Idle Losses/Tank	L_{SL}	lbs	6.92E-03	5.66E-03	6.92E-03	3.07E-03	7.25E-05	8.47E-03	6.93E-03	8.47E-03	3.76E-03	4.06E-04	8.88E-05	Total Uncontrolled VOC Standing Idle Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Standing Idle Losses/Tank	L_{SL}	lbs	12.99	10.63	12.99	5.77	0.14	15.91	13.02	15.91	7.07	0.76	0.17	Assumes that unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Standing Idle Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**0.84**	**0.69**	**0.84**	**0.37**	**8.84E-03**	**0.52**	**0.42**	**0.52**	**0.23**	**0.02**	**5.41E-03**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly Controlled H_2S Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**1.15E-03**	**9.44E-04**	**1.15E-03**	**5.12E-04**	**1.21E-05**	**7.06E-04**	**5.78E-04**	**7.06E-04**	**3.14E-04**	**3.39E-05**	**7.40E-06**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly SO_2 Emissions from Control of Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**2.16**	**1.77**	**2.16**	**0.96**	**0.02**	**1.33**	**1.09**	**1.33**	**0.59**	**0.06**	**0.01**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.

Table E-9
Storage Tank Roof Landing Emissions (EPNs: VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

		Drain-Dry	Product Change Landings					Degassing						
Parameter	Variable	Tank Size:	467k BBL	373k BBL	310k BBL	202k BBL	1k BBL	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	Information Source
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	T-201, T-202	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202	
		Product:	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Controlled Filling Losses (EPNs: VCU-4 and PORTVC)														
Total Uncontrolled VOC Filling Losses/Tank	L_{FL}	lbs	1,264.90	1,035.44	1,264.90	562.18	13.26	1,730.91	1,416.92	1,730.91	769.30	83.05	18.14	AP-42 Section 7.1 (Jun 2020), Eqn. (3-18): $L_{FL} = [(P_{VA}V_V)/(RT_{LA})]*M_V*S$ / Episode
Total Controlled VOC Filling Losses/Tank	L_{FL}	lbs	1.26	1.04	1.26	0.56	0.01	1.73	1.42	1.73	0.77	0.08	0.02	Total Uncontrolled VOC Filling Losses (lbs) × (1 - DRE %)
Total Controlled H_2S Filling Losses/Tank	L_{FL}	lbs	1.73E-03	1.42E-03	1.73E-03	7.68E-04	1.81E-05	2.37E-03	1.94E-03	2.37E-03	1.05E-03	1.14E-04	2.48E-05	Total Uncontrolled VOC Filling Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Filling Losses/Tank	L_{FL}	lbs	3.25	2.66	3.25	1.44	0.03	4.44	3.64	4.44	1.97	0.21	0.05	Assumes that all unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Filling Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.32**	**0.32**	**0.32**	**0.32**	**0.01**	**0.32**	**0.32**	**0.32**	**0.32**	**0.08**	**0.02**	Total Controlled VOC Filling Losses (lbs) ÷ Refill Duration (hours) If the Refill Duration is < 1 hour, then the Total Controlled VOC Filling Losses all occur in the worst-case hour.
Max. Hourly Controlled H_2S Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**1.81E-05**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**1.14E-04**	**2.48E-05**	Total Controlled VOC Filling Losses (lbs/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Control of Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	Total SO_2 from Controlled Filling Losses/Tank (lbs) ÷ Refill Duration (hours)
Total Controlled Losses (EPNs: VCU-4 and PORTVC)														
Total Controlled VOC Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	6.32	5.18	6.32	2.81	0.07	7.93	6.49	7.93	3.52	0.38	0.08	Total Controlled VOC Standing Idle Losses/Tank (lbs) + Total Controlled VOC Filling Losses/Tank (lbs)
Total Controlled H_2S Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	8.65E-03	7.08E-03	8.65E-03	3.84E-03	9.06E-05	0.01	8.87E-03	0.01	4.82E-03	5.20E-04	1.14E-04	Total Controlled H_2S Standing Idle Losses/Tank (lbs) + Total Controlled H_2S Filling Losses/Tank (lbs)
Total Controlled SO_2 Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	16.23	13.29	16.23	7.22	0.17	20.35	16.66	20.35	9.04	0.98	0.21	Total SO_2 from Controlled Standing Idle Losses/Tank (lbs) + Total SO_2 from Controlled Filling Losses/Tank (lbs)
Total Annual Controlled VOC Losses (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**0.03**	--	**0.04**	--	--	**0.02**	--	**0.02**	--	--	--	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**3.46E-05**	--	**5.19E-05**	--	--	**2.17E-05**	--	**3.25E-05**	--	--	--	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**0.06**	--	**0.10**	--	--	**0.04**	--	**0.06**	--	--	--	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled VOC Losses (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**0.20**	**0.01**	--	**2.81E-03**	**1.33E-04**	**0.12**	**6.49E-03**	--	**1.76E-03**	**3.80E-04**	**8.31E-05**	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**2.68E-04**	**1.42E-05**	--	**3.84E-06**	**1.81E-07**	**1.68E-04**	**8.87E-06**	--	**2.41E-06**	**5.20E-07**	**1.14E-07**	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**0.50**	**0.03**	--	**7.22E-03**	**3.40E-04**	**0.32**	**0.02**	--	**4.52E-03**	**9.76E-04**	**2.13E-04**	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton

Table E-10
Storage Tank Roof Landing Emissions (EPNs: VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Drain-Dry	Product Change Landings			Degassing			Information Source
		Tank Size:	467k BBL	373k BBL	202k BBL	467k BBL	373k BBL	202k BBL	
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	
		Product:	Condensate	Condensate	Condensate	Condensate	Condensate	Condensate	
Diameter	D	ft	210	190	140	210	190	140	
Landed Roof Height	h_v	ft	3.17	3.17	3.17	4.33	4.33	4.33	The roof height for product change landings corresponds to the highest critical zone height of all tanks (3 feet, 2 inches). The roof height for degassing corresponds to the highest roof float height of all tanks (4 feet, 4 inches).
Total Volume under Floating Roof	V_V	ft^3	109,680.85	89,784.10	48,747.05	150,089.59	122,862.45	66,706.48	Equation (1-3, using h_v): $h_v \pi D^2/4$
Hours/Day	n_d	dimensionless	24	24	24	24	24	24	
Maximum Standing Idle Duration	T_{stand}	hours/event	24	24	24	24	24	24	
Refilling Rate		bbl/hr	5,000	5,000	5,000	5,000	5,000	5,000	
Refilling Duration	T_{fill}	hours/event	3.91	3.20	1.74	5.35	4.38	2.38	$T_{fill} = V_V$ (ft^3) ÷ Conversion (ft^3/bbl) ÷ Refilling Rate (bbl/hr)
Controlled Roof Landing Episodes/Year/Tank	n_d	dimensionless	2	2	2	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	0	4	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks. The othe tanks do not store condensate.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	1	31	2	1	
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-19.
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
MW Liquid	M_L	lb/lb-mole	92	92	92	92	92	92	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for all Motor Gasolines.
MW Vapor	M_V	lb/lb-mole	65	65	65	65	65	65	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, interpolated for Motor Gasoline (RVP 11).
MW H_2S	-	lb/lb-mole	34.08	34.08	34.08	34.08	34.08	34.08	Liquid and vapor MW of H_2S
Liquid Density	W_L	lb/gal	5.60	5.60	5.60	5.60	5.60	5.60	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for all Motor Gasolines.
Liquid Mole Fraction H_2S	X_{H2S}	-	2.70E-05	2.70E-05	2.70E-05	2.70E-05	2.70E-05	2.70E-05	X_{H2S} = Liquid H_2S Conc (ppmw) ÷ 1,000,000 parts/million parts × MW Condensate Liquid (lb/lb-mole) ÷ MW H_2S (lb/lb-mole)
Liquid Mole Fraction VOC	X_{VOC}	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	Conservatively assumes that the liquid is all VOC.
H_2S K Value	K_{H2S}	-	19.628	19.628	19.628	19.628	19.628	19.628	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.70	8.70	8.70	8.70	8.70	8.70	Calculated using Figure 7.1-14b from AP-42 Section 7.1 (Jun 2020). RVP = 13.5, T = 70°F.
VOC K Value	K_{VOC}	-	0.5916	0.5916	0.5916	0.5916	0.5916	0.5916	$K_{VOC} = P_{VA}$ ÷ 14.7 psia
Vapor Mole Fraction H_2S	Y_{H2S}	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	$Y_{H2S} = X_{H2S} \times K_{H2S}$
Vapor Mole Fraction VOC	Y_{VOC}	-	0.5916	0.5916	0.5916	0.5916	0.5916	0.5916	$Y_{VOC} = X_{VOC} \times K_{VOC}$
Wt. Fraction H_2S in VOC	Z_{H2S}	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	$Z_{H2S} = Y_{H2S} \div Y_{VOC}$ ÷ MW Condensate Vapor (lb/lb-mole) × MW H_2S (lb/lb-mole)
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	Z_{H2S} as a percentage
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.600	529.600	529.600	529.600	529.600	529.600	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Clingage Factor	C_S	bbl/1,000 ft^2	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-10, factor for gasoline, gunite lining shell condition.
Controlled Standing Idle Losses (EPNs: VCU-4 and PORTVC)									
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	1,221.96	1,000.29	543.09	AP-42 Section 7.1 (Jun 2020), Eqn. (3-11): $L_{SL} = 0.042*C_S*W_L*(\pi*D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	$L_{SL,max}$	lbs	6,545.78	5,358.34	2,909.24	8,957.38	7,332.46	3,981.06	AP-42 Section 7.1 (Jun 2020), Eqn. (3-14): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	1,221.96	1,000.29	543.09	AP-42 Section 7.1 (Jun 2020), Eqn. (3-15): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Controlled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1.22	1.00	0.54	1.22	1.00	0.54	Total Uncontrolled VOC Standing Idle Losses (lbs) × (1 - DRE %)
Total Controlled H_2S Standing Idle Losses/Tank	L_{SL}	lbs	5.74E-04	4.70E-04	2.55E-04	5.74E-04	4.70E-04	2.55E-04	Total Uncontrolled VOC Standing Idle Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Standing Idle Losses/Tank	L_{SL}	lbs	1.08	0.88	0.48	1.08	0.88	0.48	Assumes that unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Standing Idle Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**0.20**	**0.17**	**0.09**	**0.10**	**0.08**	**0.05**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly Controlled H_2S Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**9.56E-05**	**7.83E-05**	**4.25E-05**	**4.78E-05**	**3.91E-05**	**2.13E-05**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly SO_2 Emissions from Control of Standing Idle Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.18**	**0.15**	**0.08**	**0.09**	**0.07**	**0.04**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.

Table E-10
Storage Tank Roof Landing Emissions (EPNs: VCU-4 and PORTVC) - <u>Condensate</u>
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Drain-Dry	Product Change Landings			Degassing			Information Source
		Tank Size:	467k BBL	373k BBL	202k BBL	467k BBL	373k BBL	202k BBL	
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	
		Product:	Condensate	Condensate	Condensate	Condensate	Condensate	Condensate	
Controlled Filling Losses (EPNs: VCU-4 and PORTVC)									
Total Uncontrolled VOC Filling Losses/Tank	L_{FL}	lbs	1,636.44	1,339.58	727.31	2,239.35	1,833.12	995.26	AP-42 Section 7.1 (Jun 2020), Eqn. (3-18): $L_{FL} = [(P_{VA}V_V)/(RT_{LA})]*M_V*S$ / Episode
Total Controlled VOC Filling Losses/Tank	L_{FL}	lbs	1.64	1.34	0.73	2.24	1.83	1.00	Total Uncontrolled VOC Filling Losses (lbs) × (1 - DRE %)
Total Controlled H_2S Filling Losses/Tank	L_{FL}	lbs	7.68E-04	6.29E-04	3.42E-04	1.05E-03	8.61E-04	4.67E-04	Total Uncontrolled VOC Filling Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Filling Losses/Tank	L_{FL}	lbs	1.44	1.18	0.64	1.97	1.62	0.88	Assumes that all unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Filling Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.42**	**0.42**	**0.42**	**0.42**	**0.42**	**0.42**	Total Controlled VOC Filling Losses (lbs) ÷ Refill Duration (hours) If the Refill Duration is < 1 hour, then the Total Controlled VOC Filling Losses all occur in the worst-case hour
Max. Hourly Controlled H_2S Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	Total Controlled VOC Filling Losses (lbs/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Control of Filling Losses/Tank (EPNs: VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.37**	**0.37**	**0.37**	**0.37**	**0.37**	**0.37**	Total SO_2 from Controlled Filling Losses/Tank (lbs) ÷ Refill Duration (hours)
Total Controlled Losses (EPNs: VCU-4 and PORTVC)									
Total Controlled VOC Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	2.86	2.34	1.27	3.46	2.83	1.54	Total Controlled VOC Standing Idle Losses/Tank (lbs) + Total Controlled VOC Filling Losses/Tank (lbs)
Total Controlled H_2S Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	1.34E-03	1.10E-03	5.97E-04	1.63E-03	1.33E-03	7.22E-04	Total Controlled H_2S Standing Idle Losses/Tank (lbs) + Total Controlled H_2S Filling Losses/Tank (lbs)
Total Controlled SO_2 Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	2.52	2.06	1.12	3.05	2.50	1.36	Total SO_2 from Controlled Standing Idle Losses/Tank (lbs) + Total SO_2 from Controlled Filling Losses/Tank (lbs)
Total Annual Controlled VOC Losses (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**0.01**	**--**	**--**	**6.92E-03**	**--**	**--**	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**5.37E-06**	**--**	**--**	**3.25E-06**	**--**	**--**	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN: VCU-4)	**$L_{SL}+L_{FL}$**	**tpy**	**0.01**	**--**	**--**	**6.10E-03**	**--**	**--**	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled VOC Losses (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**0.09**	**4.68E-03**	**1.27E-03**	**0.05**	**2.83E-03**	**7.69E-04**	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**4.16E-05**	**2.20E-06**	**5.97E-07**	**2.52E-05**	**1.33E-06**	**3.61E-07**	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN: PORTVC)	**$L_{SL}+L_{FL}$**	**tpy**	**0.08**	**4.13E-03**	**1.12E-03**	**0.05**	**2.50E-03**	**6.78E-04**	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton

Table E-11
Storage Tank Degassing Emissions (EPNs: VCU-4, PORTVC, and MSS-ATM) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Tank Size:	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	Information Source
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202	
		Product:	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Diameter	D	ft	210	190	210	140	46.0	21.5	
Deck Height on Legs for Controlled Degassing and Uncontrolled Venting	h_V	ft	4.33	4.33	4.33	4.33	4.33	4.33	
VCU Maximum Volumetric Flow	V_{VP}	ft^3/hour	39,302	39,302	39,302	39,302	39,302	39,302	Used as the flow rate for controlled emissions from EPN: VCU-4.
Uncontrolled Venting Maximum Volumetric Flow	V_{VP}	ft^3/hour	200,000	200,000	200,000	200,000	200,000	200,000	Used as the flow rate for uncontrolled emissions from EPN: MSS-ATM.
Uncontrolled Venting Maximum Velocity (Surface Wind Speed)	U_S	m/s	4.89E-04	5.97E-04	4.89E-04	1.10E-03	0.01	0.05	= Degassing Rate (ft^3/hr) ÷ 3600 s/hr ÷ Surface Area of Tank Bottom (ft^2) ÷ 3.281 ft/m
Total Volume under Floating Roof	V_V	ft^3	150,090	122,862	150,090	66,706	7,202	1,573	AP-42 Section 7.1 (Jun 2020), Eqn. (1-3, using h_V): $h_V \pi D^2/4$
Tank Bottom Surface Area	A_P	m^2	3,217.80	2,634.07	3,217.80	1,430.13	154.40	33.73	
Controlled Degassing Episodes/Year/Tank	n_d	dimensionless	1	1	1	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	--	6	--	--	--	The permanent VCU (EPN: VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	--	1	2	2	
Turnovers per Tank per Event	-	dimensionless	4	4	4	4	4	4	
Duration per Controlled Degassing Event	T_{degas}	hrs/event	15.3	12.5	15.3	6.8	0.7	0.2	$T_{degas} = V_V$ (ft^3) × Turnovers/tank-event ÷ VCU Maximum Volumetric Flow (ft^3/hour)
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-19.
MW Vapor	M_V	lb/lb-mole	50	50	50	50	50	50	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Liquid Density	W_L	lb/gal	7.10	7.10	7.10	7.10	7.10	7.10	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for Midcontinent Crude Oil.
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	See Table E-9 for calculation.
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.74	8.74	8.74	8.74	8.74	8.74	Calculated using Figure 7.1-13b from AP-42 Section 7.1 (Jun 2020). RVP = 10, T = 70°F.
		Pascals	60,251.94	60,251.94	60,251.94	60,251.94	60,251.94	60,251.94	
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.6	529.6	529.6	529.6	529.6	529.6	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Tank Degassing VOC Concentration Level	-	ppmv	10,000	10,000	10,000	10,000	10,000	10,000	10,000 ppmv is the degassing limit according to TCEQ BACT for Storage Tank MSS
Total Uncontrolled VOC Venting Losses / Tank / Episode	$L_{degas,VOC}$	lbs	198.01	162.09	198.01	88.00	9.50	2.08	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × Total Volume Under Floating Roof (ft^3) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole)
Total Uncontrolled H_2S Venting Emissions / Tank / Episode	$L_{degas,H2S}$	lbs	0.27	0.22	0.27	0.12	0.01	2.84E-03	Quantity of H_2S remaining in tank at the maximum Tank Degassing VOC Concentration Level. Total Uncontrolled VOC Venting Losses / Episode ($L_{degas,VOC}$) × % H_2S in Vapors
Clingage Factor	C_S	bbl/1,000 ft^2	0.60	0.60	0.60	0.60	0.60	0.60	AP-42 Section 7.1 (Jun 2020), Table 7.1-10, factor for crude oil, gunite lining shell condition.
Total Controlled Degassing Losses (EPNs: VCU-4 and PORTVC)									
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1 (Jun 2020), Eqn. (3-11): $L_{SL} = 0.042*C_S*W_L*(\pi*D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	L_{SL}	lbs	6,923.66	5,667.67	6,923.66	3,077.18	332.21	72.57	AP-42 Section 7.1 (Jun 2020), Eqn. (3-14): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1 (Jun 2020), Eqn. (3-15): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Max. Hourly Controlled VOC Degassing Losses Prior to Venting (EPNs: VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**1.57**	**1.57**	**1.57**	**1.57**	**0.29**	**0.06**	(Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses/Tank (lbs)) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × (1 - DRE %) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Max. Hourly Controlled H_2S Degassing Losses Prior to Venting (EPNs: VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**2.15E-03**	**2.15E-03**	**2.15E-03**	**2.15E-03**	**3.93E-04**	**8.60E-05**	Max. Hourly Controlled VOC Degassing Losses Prior to Venting (lb/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Combustion of Degassing Losses (EPNs: VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**0.03**	**0.03**	**0.03**	**0.03**	**5.58E-03**	**1.22E-03**	Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Total Controlled Degassing VOC Emissions / Tank / Episode	L_{degas}	lbs	6.00	4.91	6.00	2.67	0.29	0.06	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × (1 - DRE %)
Total Controlled Degassing H_2S Emissions / Tank / Episode	L_{degas}	lbs	8.20E-03	6.71E-03	8.20E-03	3.64E-03	3.93E-04	8.60E-05	Total Controlled Degassing VOC Emissions / Episode (lbs) × % H_2S in Vapors
Total Degassing SO_2 Emissions / Tank / Episode	L_{degas}	lbs	15.40	12.61	15.40	6.84	0.74	0.16	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)

Table E-11
Storage Tank Degassing Emissions (EPNs: VCU-4, PORTVC, and MSS-ATM) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Tank Size:	467k BBL	373k BBL	310k BBL	202k BBL	12.6k BBL	1k BBL	Information Source
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202	
		Product:	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Total Controlled Degassing VOC Emissions / Year (EPN: VCU-4)	L_{degas}	tpy	0.01	--	0.02	--	--	--	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN: VCU-4)	L_{degas}	tpy	1.64E-05	--	2.46E-05	--	--	--	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN: VCU-4)	L_{degas}	tpy	0.03	--	0.05	--	--	--	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing VOC Emissions / Year (EPN: PORTVC)	L_{degas}	tpy	0.09	4.91E-03	--	1.33E-03	2.88E-04	6.29E-05	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN: PORTVC)	L_{degas}	tpy	1.27E-04	6.71E-06	--	1.82E-06	3.93E-07	8.60E-08	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN: PORTVC)	L_{degas}	tpy	0.24	0.01	--	3.42E-03	7.39E-04	1.61E-04	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Uncontrolled Atmospheric Degassing Emissions (EPN: MSS-ATM)									
Max. Hourly Uncontrolled VOC Venting Losses (EPN: MSS-ATM)	L_{degas}	lbs/hr	177.81	162.09	177.81	88.00	9.50	2.08	**From TCEQ's MSS Guidance (Sep 2012), equation for forced ventilation in Section III.5.B.(9): ER (lb/hr) = $4.14(10^{-5}U_S^{0.78}P_VM_W^{0.67}A_P^{0.94})$, where P_V is in Pascals, A_P is in m^2, and U_S is in m/s.** **If the emissions from the forced ventilation equation are greater than the VOC mass remaining at 10,000 ppmv, then the VOC mass remaining at 10,000 ppmv is used here.**
Max. Hourly Uncontrolled H_2S Venting Losses (EPN: MSS-ATM)	L_{degas}	lbs/hr	0.24	0.22	0.24	0.12	0.01	2.84E-03	**Max. Hourly Uncontrolled VOC Venting Losses (lb/hr) × % H_2S in Vapors**
Total Annual Uncontrolled VOC Venting Losses (EPN: MSS-ATM)	L_{degas}	tpy	3.47	0.16	0.59	0.04	9.50E-03	2.08E-03	**Total Uncontrolled VOC Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks** **Annual emissions are for the group of tanks, not per tank.**
Total Annual Uncontrolled H_2S Venting Losses (EPN: MSS-ATM)	L_{degas}	tpy	4.74E-03	2.22E-04	8.12E-04	6.01E-05	1.30E-05	2.84E-06	**Total Uncontrolled H_2S Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks** **Annual emissions are for the group of tanks, not per tank.**

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton
379	scf/lb-mole at 60°F and 1 atm

Table E-12
Storage Tank Degassing Emissions (EPNs: VCU-4, PORTVC, and MSS-ATM) - Condensate
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Tank Size:	467k BBL	373k BBL	202k BBL	Information Source
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	
		Product:	Condensate	Condensate	Condensate	
Diameter	D	ft	210	190	140	
Deck Height on Legs for Controlled Degassing and Uncontrolled Venting	h_V	ft	4.33	4.33	4.33	
VCU Maximum Volumetric Flow	V_{VP}	ft^3/hour	39,302	39,302	39,302	Used as the flow rate for controlled emissions from EPN: VCU-4.
Uncontrolled Venting Maximum Volumetric Flow	V_{VP}	ft^3/hour	200,000	200,000	200,000	Used as the flow rate for uncontrolled emissions from EPN: MSS-ATM.
Uncontrolled Venting Maximum Velocity (Surface Wind Speed)	U_S	m/s	4.89E-04	5.97E-04	1.10E-03	= Degassing Rate (ft^3/hr) ÷ 3600 s/hr ÷ Surface Area of Tank Bottom (ft^2) ÷ 3.281 ft/m
Total Volume under Floating Roof	V_V	ft^3	150,090	122,862	66,706	AP-42 Section 7.1 (Jun 2020), Eqn. (1-3, using h_V): $h_V \pi D^2/4$
Tank Bottom Surface Area	A_P	m^2	3,217.80	2,634.07	1,430.13	
Controlled Degassing Episodes/Year/Tank	n_d	dimensionless	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	--	--	The permanent VCU (EPN: VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks. The other tanks do not store condensate.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	1	
Turnovers per Tank per Event	-	dimensionless	4	4	4	
Duration per Controlled Degassing Event	T_{degas}	hrs/event	15.3	12.5	6.8	T_{degas} = V_V (ft^3) × Turnovers/tank-event ÷ VCU Maximum Volumetric Flow (ft^3/hour)
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-19.
MW Vapor	M_V	lb/lb-mole	65	65	65	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, interpolated for Motor Gasoline (RVP 11).
Liquid Density	W_L	lb/gal	5.60	5.60	5.60	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for all Motor Gasolines.
Liquid H_2S Concentration	-	ppmw	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
% H_2S in Liquid	-	%	0.00%	0.00%	0.00%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.05%	0.05%	0.05%	See Table E-10 for calculation.
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.70	8.70	8.70	Calculated using Figure 7.1-14b from AP-42 Section 7.1 (Jun 2020). RVP = 13.5, T = 70°F.
		Pascals	59,961.59	59,961.59	59,961.59	
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.6	529.6	529.6	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	
Tank Degassing VOC Concentration Level	-	ppmv	10,000	10,000	10,000	10,000 ppmv is the degassing limit according to TCEQ BACT for Storage Tank MSS
Total Uncontrolled VOC Venting Losses / Tank / Episode	L_{degas}	lbs	257.41	210.71	114.40	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × Total Volume Under Floating Roof (ft^3) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole)
Total Uncontrolled H_2S Venting Emissions / Tank / Episode	L_{degas}	lbs	0.12	0.10	0.05	Quantity of H_2S remaining in tank at the maximum Tank Degassing VOC Concentration Level. Total Uncontrolled VOC Venting Losses / Episode ($L_{degas,VOC}$) × % H_2S in Vapors
Clingage Factor	C_S	bbl/1,000 ft^2	0.15	0.15	0.15	AP-42 Section 7.1 (Jun 2020), Table 7.1-10, factor for gasoline, gunite lining shell condition.
Total Controlled Degassing Losses (EPNs: VCU-4 and PORTVC)						
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	AP-42 Section 7.1 (Jun 2020), Eqn. (3-11): $L_{SL} = 0.042 * C_S * W_L * (\pi * D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	L_{SL}	lbs	8,957.38	7,332.46	3,981.06	AP-42 Section 7.1 (Jun 2020), Eqn. (3-14): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	AP-42 Section 7.1 (Jun 2020), Eqn. (3-15): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Max. Hourly Controlled VOC Degassing Losses Prior to Venting (EPNs: VCU-4 and PORTVC)	L_{degas}	**lbs/hr**	**0.25**	**0.25**	**0.25**	(Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses/Tank (lbs)) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × (1 - DRE %) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Max. Hourly Controlled H_2S Degassing Losses Prior to Venting (EPNs: VCU-4 and PORTVC)	L_{degas}	**lbs/hr**	**1.19E-04**	**1.19E-04**	**1.19E-04**	Max. Hourly Controlled VOC Degassing Losses Prior to Venting (lb/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Combustion of Degassing Losses (EPNs: VCU-4 and PORTVC)	L_{degas}	**lbs/hr**	**6.01E-03**	**6.01E-03**	**6.01E-03**	Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.

Table E-12
Storage Tank Degassing Emissions (EPNs: VCU-4, PORTVC, and MSS-ATM) - Condensate
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Tank Size:	467k BBL	373k BBL	202k BBL	Information Source
		Tank Numbers:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126	
		Product:	Condensate	Condensate	Condensate	
Total Controlled Degassing VOC Emissions / Tank / Episode	L_{degas}	lbs	0.96	0.79	0.43	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × (1 - DRE %)
Total Controlled Degassing H_2S Emissions / Tank / Episode	L_{degas}	lbs	4.53E-04	3.71E-04	2.01E-04	Total Controlled Degassing VOC Emissions / Episode (lbs) × % H_2S in Vapors
Total Degassing SO_2 Emissions / Tank / Episode	L_{degas}	lbs	0.85	0.70	0.38	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Total Controlled Degassing VOC Emissions / Year (EPN: VCU-4)	L_{degas}	**tpy**	**1.93E-03**	--	--	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN: VCU-4)	L_{degas}	**tpy**	**9.06E-07**	--	--	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN: VCU-4)	L_{degas}	**tpy**	**1.70E-03**	--	--	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing VOC Emissions / Year (EPN: PORTVC)	L_{degas}	**tpy**	**0.01**	**7.90E-04**	**2.14E-04**	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN: PORTVC)	L_{degas}	**tpy**	**7.02E-06**	**3.71E-07**	**1.01E-07**	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN: PORTVC)	L_{degas}	**tpy**	**0.01**	**6.96E-04**	**1.89E-04**	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Uncontrolled Atmospheric Degassing Emissions (EPN: MSS-ATM)						
Max. Hourly Uncontrolled VOC Venting Losses (EPN: MSS-ATM)	L_{degas}	**lbs/hr**	**210.96**	**204.31**	**114.40**	**From TCEQ's MSS Guidance (Sep 2012), equation for forced ventilation in Section III.5.B.(9): ER (lb/hr) = $4.14(10^{-5}U_S^{0.78}P_VM_W^{0.67}A_P^{0.94})$, where P_V is in Pascals, A_P is in m^2, and U_S is in m/s.** **If the emissions from the forced ventilation equation are greater than the VOC mass remaining at 10,000 ppmv, then the VOC mass remaining at 10,000 ppmv is used here.**
Max. Hourly Uncontrolled H_2S Venting Losses (EPN: MSS-ATM)	L_{degas}	**lbs/hr**	**0.10**	**0.10**	**0.05**	**Max. Hourly Uncontrolled VOC Venting Losses (lb/hr) × % H_2S in Vapors**
Total Annual Uncontrolled VOC Venting Losses (EPN: MSS-ATM)	L_{degas}	**tpy**	**4.50**	**0.21**	**0.06**	**Total Uncontrolled VOC Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks** **Annual emissions are for the group of tanks, not per tank.**
Total Annual Uncontrolled H_2S Venting Losses (EPN: MSS-ATM)	L_{degas}	**tpy**	**2.12E-03**	**9.89E-05**	**2.69E-05**	**Total Uncontrolled H_2S Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks** **Annual emissions are for the group of tanks, not per tank.**

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton
379	scf/lb-mole at 60°F and 1 atm

Table E-13
Storage Tank Degassing Emissions (EPN: MSS-ATM) - Bunker Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Variable	Units	Value	Information Source
Diameter	D	ft	100	
Roof Height	h_s	ft	60	
Height of Stock Liquid	h_{le}	ft	0.5	
Total Volume	V_V	ft^3	472,496	AP-42 Section 7.1, Eqn. (4-3) (Jun 2020), using h_{VO}: $V_V = h_{VO}\pi D^2/4$
Tank Bottom Surface Area	A_P	m^2	729.66	
Uncontrolled Venting Maximum Volumetric Flow	V_{VP}	ft^3/hour	200,000	
Length of Degassing Episodes (days)	n_d	days	2	
Number of Tanks	-	Dimensionless	3	
Filling Saturation Factor	S	Dimensionless	0.33	AP-42 Section 7.1, Eqn. (4-5) (Jun 2020): $S = (0.5n_d + 1) / 6$
MW Vapor	M_V	lb/lb-mole	130	
Liquid Density	W_L	lb/gal	7.90	AP-42 Section 7.1 (Jun 2020), Table 7.1-2, value for No. 6 Fuel Oil.
True Vapor Pressure @ T_{LX}	P_{VA}	psia @ T_{LX}	0.02	Based on SDS
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	0.02	Based on SDS
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	
Vapor Space Outage	H_{VO}	ft	60.16	AP-42 Section 7.1, Eqn. (1-16) (Jun 2020): $H_{VO}=H_S-H_L+H_{RO}$
Roof Outage	H_{RO}	ft	0.66	AP-42 Section 7.1, Eqn. (1-17) (Jun 2020): $H_{RO}=0.33*h_R$ - Assuming a 2 foot roof
Vapor Space Expansion Factor	K_E	-	0.02	AP-42 Section 7.1, Eqn. (1-12) (Jun 2020): $K_E = 0.0018\Delta T_V = 0.0018 [0.7 (T_{AX} - T_{AN}) + 0.02\alpha I]$
Saturation Factor	K_S	-	0.94	AP-42 Section 7.1, Eqn. (1-21) (Jun 2020): $K_S=1/(1+0.053P_{VA}*H_{vo})$
Maximum Temperature	T_{LX}	°R	554.60	Max temperature = 95°F; °R = °F + 459.6
Average Temperature	T_{LA}	°R	529.60	Average temperature = 70°F; °R = °F + 459.6
Clingage Factor	C_S	bbl/1,000 ft^3	0.15	Factor for single-component stock in a tank with a gunite lining condition, from AP-42 Section 7.1, Table 7.1-10 (Jun 2020).
TOTAL DEGASSING LOSS				
Forced Vent Emissions	L_{FV}	lbs/tk-event	68.81	AP-42 Section 7.1, Eqn. (4-1) (Jun 2020): $L_{FV} = L_P + L_{CV}$
Vapor Space Purge Emissions	L_P	lbs/tk-event	68.81	AP-42 Section 7.1, Eqn. (4-2) (Jun 2020): $L_P = (P_{VA} V_V / R T_V) M_V S$
Continued Forced Ventilation Emissions	L_{CV}	lbs/tk-event	--	AP-42 Section 7.1, Eqn. (4-12) (Jun 2020): $L_{CV} <= 5.9 D^2 h_{le} W_L$; $h_{le} = 0$ for a drain dry tank.
UNCONTROLLED ATMOSPHERIC DEGASSING EMISSIONS				
Max. Hourly Uncontrolled VOC Venting Losses	**L_{degas}**	**lbs/hr**	**29.12**	**L_{FV} (lbs/tk-event) / Duration of Event Duration of event is based on the total volume and uncontrolled venting maximum volumetric flow. If the total volume is < maximum volumetric flow, all of the emissions are emitted in the worst-case hour. If the total volume is > maximum volumetric flow, emissions are L_{FV} (lbs/tk-event) / (Total Volume (ft^3) / Uncontrolled Venting Maximum Volumetric Flow (ft^3/hr))**
Total Annual Uncontrolled VOC Venting Losses	**L_{degas}**	**tpy**	**0.10**	**Total Uncontrolled VOC Venting Losses/Tank/Episode (lbs) × Uncontrolled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks**

Conversions:

2,000 lb/ton

Table E-14
MSS Summary - VOC Emissions (EPNs: VCU-4, PORTVC, and MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside, LLC

The permanent VCU (EPN: VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks

		Maximum Short-term Emissions (lb/hr)									Maximum Short-term Emissions [1] (lb/hr)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
Roof Landings (at 3'2")											
Standing	VCU-4	0.84	0.20			0.84					0.84
Refilling	VCU-4	0.32	0.42			0.32					0.42
Standing	PORTVC	0.84	0.20	0.69	0.17		0.37	0.09	--	8.84E-03	0.84
Refilling	PORTVC	0.32	0.42	0.32	0.42		0.32	0.42	--	0.01	0.42
Roof Landing (at 4'4")											
Refilling	VCU-4	0.32	0.42			0.32					0.42
Controlled Degassing	VCU-4	1.57	0.25			1.57					1.57
Roof Landing (at 4'4")											
Refilling	PORTVC	0.32	0.42	0.32	0.42		0.32	0.42	0.08	0.02	0.42
Controlled Degassing	PORTVC	1.57	0.25	1.57	0.25		1.57	0.25	0.29	0.06	1.57
Uncontrolled Venting	MSS-ATM	177.81	210.96	162.09	204.31	177.81	88.00	114.40	9.50	2.08	210.96

		Annual Emissions (tpy)									Annual Storage Tank Emissions [2] (tpy)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
VCU-4											
Roof Landings (at 3'2")	VCU-4	0.03	0.01	--	--	0.04	--	--	--	--	0.06
Roof Landing (at 4'4")	VCU-4	0.02	6.92E-03	--	--	0.02	--	--	--	--	0.04
Controlled Degassing	VCU-4	0.01	1.93E-03	--	--	0.02	--	--	--	--	0.03
PORTVC											
Roof Landings (at 3'2")	PORTVC	0.20	0.09	0.01	4.68E-03	--	2.81E-03	1.27E-03	--	1.33E-04	0.21
Roof Landing (at 4'4")	PORTVC	0.12	0.05	6.49E-03	2.83E-03	--	1.76E-03	7.69E-04	3.80E-04	8.31E-05	0.13
Controlled Degassing	PORTVC	0.09	0.01	4.91E-03	7.90E-04	--	1.33E-03	2.14E-04	2.88E-04	6.29E-05	0.10
MSS-ATM											
Uncontrolled Venting	MSS-ATM	3.47	4.50	0.16	0.21	0.59	0.04	0.06	9.50E-03	2.08E-03	5.38

Worst-Case Annual Emissions Determination

		Annual Emissions (tpy)					
Activity	EPN	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
VCU-4							
Product Change Landings [3]	VCU-4	0.03	--	0.04	--	--	--
Controlled Degassing [4]	VCU-4	0.03	--	0.04	--	--	--
PORTVC							
Product Change Landings [3]	PORTVC	0.20	0.01	--	2.81E-03	--	1.33E-04
Controlled Degassing [4]	PORTVC	0.22	0.01	--	3.09E-03	6.68E-04	1.46E-04
MSS-ATM							
Uncontrolled Venting [5]	MSS-ATM	4.50	0.21	0.59	0.06	9.50E-03	2.08E-03
Maximum [6]	**MSS Limit**	**4.97**	**0.23**	**0.67**	**0.06**	**0.01**	**2.35E-03**

Emissions Summary

EPN	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
VCU-4 [7]	1.57	0.13
PORTVC [7]	1.57	0.44
MSS-ATM	210.96	5.38
MSS Limit [8]	**210.96**	**5.95**

Notes:
[1] Maximum short-term emissions (lb/hr) are the maximum emissions of all products in each tank size, per activity. Only one activity will occur in the worst-case hour.
[2] Annual emissions (tpy) are the sum of the maximum emissions per product, per tank:
Max from 467k BBL Tanks for all products + max from 373k BBL Tanks for all products + 310k BBL Tanks + max from 202k BBL Tanks for all products + 12.6k BBL Tanks + 1k BBL Tanks
[3] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of crude and condensate.
[4] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum sum of Roof Landing (at 4'4") + maximum of Controlled Degassing of crude and condensate.
[5] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of Uncontrolled Venting of crude and condensate.
[6] Emissions are the sum of Product Change Landings + Controlled Degassing + Uncontrolled Venting.
[7] Maximum short-term emissions (lb/hr) are the maximum of each activity which uses EPN: VCU-4 or PORTVC. Only one activity will occur in the worst-case hour.
Annual emissions (tpy) are the sum of Product Change Landings + Controlled Degassing from all tanks.
[8] Maximum short-term emissions (lb/hr) are the maximum emissions from EPN: VCU-4, PORTVC, or MSS-ATM.
Annual emissions (tpy) are the sum of EPNs: VCU-4, PORTVC and MSS-ATM.

Table E-15
MSS Summary - <u>H_2S Emissions</u> (EPNs: VCU-4 and MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside, LLC

The permanent VCU (EPN: VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks

		Maximum Short-term Emissions (lb/hr)									Maximum Short-term Emissions [1] (lb/hr)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
Roof Landings (at 3'2")											
Standing	VCU-4	1.15E-03	9.56E-05			1.15E-03					1.15E-03
Refilling	VCU-4	4.42E-04	1.97E-04			4.42E-04					4.42E-04
Standing	PORTVC	1.15E-03	9.56E-05	9.44E-04	7.83E-05		5.12E-04	4.25E-05	--	1.21E-05	1.15E-03
Refilling	PORTVC	4.42E-04	1.97E-04	4.42E-04	1.97E-04		4.42E-04	1.97E-04	--	1.81E-05	4.42E-04
Roof Landing (at 4'4")											
Refilling	VCU-4	4.42E-04	1.97E-04			4.42E-04					4.42E-04
Controlled Degassing	VCU-4	2.15E-03	1.19E-04			2.15E-03					2.15E-03
Roof Landing (at 4'4")											
Refilling	PORTVC	4.42E-04	1.97E-04	4.42E-04	1.97E-04		4.42E-04	1.97E-04	1.14E-04	2.48E-05	4.42E-04
Controlled Degassing	PORTVC	2.15E-03	1.19E-04	2.15E-03	1.19E-04		2.15E-03	1.19E-04	3.93E-04	8.60E-05	2.15E-03
Uncontrolled Venting	MSS-ATM	0.24	0.10	0.22	0.10	0.24	0.12	0.05	0.01	2.84E-03	0.24

		Annual Emissions (tpy)									Annual DEFR Emissions [2] (tpy)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
VCU-4											
Roof Landings (at 3'2")	VCU-4	3.46E-05	5.37E-06	--	--	5.19E-05	--	--	--	--	8.65E-05
Roof Landing (at 4'4")	VCU-4	2.17E-05	3.25E-06	--	--	3.25E-05	--	--	--	--	5.42E-05
Controlled Degassing	VCU-4	1.64E-05	9.06E-07	--	--	2.46E-05	--	--	--	--	4.10E-05
PORTVC											
Roof Landings (at 3'2")	PORTVC	2.68E-04	4.16E-05	1.42E-05	2.20E-06	--	2.81E-03	5.97E-07	--	1.81E-07	3.09E-03
Roof Landing (at 4'4")	PORTVC	1.68E-04	2.52E-05	8.87E-06	1.33E-06	--	2.41E-06	3.61E-07	5.20E-07	1.14E-07	1.80E-04
Controlled Degassing	PORTVC	1.27E-04	7.02E-06	6.71E-06	3.71E-07	--	1.82E-06	1.01E-07	3.93E-07	8.60E-08	1.36E-04
MSS-ATM											
Uncontrolled Venting	MSS-ATM	4.74E-03	2.12E-03	2.22E-04	9.89E-05	8.12E-04	6.01E-05	2.69E-05	1.30E-05	2.84E-06	5.85E-03

<u>Worst-Case Annual Emissions Determination</u>

		Annual Emissions (tpy)					
Activity	EPN	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
VCU-4							
Product Change Landings [3]	VCU-4	3.46E-05	--	5.19E-05	--	--	--
Controlled Degassing [4]	VCU-4	3.81E-05	--	5.71E-05	--	--	--
PORTVC							
Product Change Landings [3]	PORTVC	2.68E-04	1.42E-05	--	2.81E-03	--	1.81E-07
Controlled Degassing [4]	PORTVC	2.95E-04	1.56E-05	--	4.23E-06	9.13E-07	2.00E-07
MSS-ATM							
Uncontrolled Venting [5]	MSS-ATM	4.74E-03	2.22E-04	8.12E-04	6.01E-05	1.30E-05	2.84E-06
Maximum [6]	**MSS Limit**	**5.37E-03**	**2.51E-04**	**9.21E-04**	**2.88E-03**	**1.39E-05**	**3.22E-06**

<u>Emissions Summary</u>

EPN	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
VCU-4 [7]	2.15E-03	1.82E-04
PORTVC [7]	2.15E-03	3.41E-03
MSS-ATM	0.24	5.85E-03
MSS Limit [8]	**0.24**	**9.44E-03**

Notes:

[1] Maximum short-term emissions (lb/hr) are the maximum emissions of all products in each tank size, per activity. Only one activity will occur in the worst-case hour.
[2] Annual emissions (tpy) are the sum of the maximum emissions per product, per tank:
Max from 467k BBL Tanks for all products + max from 373k BBL Tanks for all products + 310k BBL Tanks + max from 202k BBL Tanks for all products + 12.6k BBL Tanks + 1k BBL Tanks
[3] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of crude and condensate.
[4] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum sum of Roof Landing (at 4'4") + maximum of Controlled Degassing of crude and condensate.
[5] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of Uncontrolled Venting of crude and condensate.
[6] Emissions are the sum of Product Change Landings + Controlled Degassing + Uncontrolled Venting.
[7] Maximum short-term emissions (lb/hr) are the maximum of each activity which uses EPN: VCU-4 or PORTVC. Only one activity will occur in the worst-case hour.
Annual emissions (tpy) are the sum of Product Change Landings + Controlled Degassing from all tanks.
[8] Maximum short-term emissions (lb/hr) are the maximum emissions from EPN: VCU-4, PORTVC, or MSS-ATM.
Annual emissions (tpy) are the sum of EPNs: VCU-4, PORTVC and MSS-ATM.

Table E-16
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs: VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

Input	VCU-4	PORTVC	Unit
NOx Emission Factor [1]	0.10	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	7.45E-03	lb/MMBtu
DRE	99.9%	99.9%	%
Heating Value of Product [3]	19,580	19,580	Btu/lb

VOCs to Control Device

Activity	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy) [5]						
Roof Landings														
Standing Idle	421.63	421.63	345.15	421.63	187.39	--	4.42	20.24	156.85	8.28	30.36	2.25	--	0.11
Refilling	323.49	323.49	323.49	323.49	323.49	--	13.26	5.06	39.21	2.07	7.59	0.56	--	0.03
Degassing														
Refilling	323.49	323.49	323.49	323.49	323.49	83.05	18.14	3.46	26.83	1.42	5.19	0.38	0.08	0.02
Degassing	392.73	392.73	392.73	392.73	392.73	287.85	62.88	12.00	92.99	4.91	18.00	1.33	0.29	0.06

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.

Combustion Emissions

Activity	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy)						
NOx [6]														
Roof Landings														
Standing Idle	0.83	0.83	0.68	0.83	0.37	--	8.65E-03	0.08	0.61	0.03	0.12	8.81E-03	--	4.15E-04
Refilling	0.63	0.63	0.63	0.63	0.63	--	0.03	9.91E-03	0.08	4.05E-03	0.01	1.10E-03	--	2.13E-06
Degassing														
Refilling	0.63	0.63	0.63	0.63	0.63	0.16	0.04	6.78E-03	0.05	2.77E-03	0.01	7.53E-04	4.18E-05	1.99E-06
Degassing	0.77	0.77	0.77	0.77	0.77	0.56	0.12	0.02	0.18	9.62E-03	0.04	2.61E-03	4.13E-04	1.97E-05
TOTAL [7]								**0.12**	**0.93**	**0.05**	**0.18**	**0.01**	**4.55E-04**	**4.39E-04**
CO [6]														
Roof Landings														
Standing Idle	0.55	0.55	0.45	0.55	0.25	--	5.79E-03	0.05	0.41	0.02	0.08	5.89E-03	--	2.78E-04
Refilling	0.42	0.42	0.42	0.42	0.42	--	0.02	6.62E-03	0.05	2.71E-03	9.94E-03	7.36E-04	--	1.42E-06
Degassing														
Refilling	0.42	0.42	0.42	0.42	0.42	0.11	0.02	4.53E-03	0.04	1.86E-03	6.80E-03	5.04E-04	2.79E-05	1.33E-06
Degassing	0.51	0.51	0.51	0.51	0.51	0.38	0.08	0.02	0.12	6.43E-03	0.02	1.75E-03	2.76E-04	1.32E-05
TOTAL [7]								**0.08**	**0.62**	**0.03**	**0.12**	**8.87E-03**	**3.04E-04**	**2.94E-04**

Table E-16
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs: VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside, LLC

Activity	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks		373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy)						
$PM/PM_{10}/PM_{2.5}$ [6]														
Roof Landings														
Standing Idle	0.06	0.06	0.05	0.06	0.03	--	6.45E-04	2.95E-03	0.02	1.21E-03	4.43E-03	3.28E-04	--	1.55E-05
Refilling	0.05	0.05	0.05	0.05	0.05	--	1.93E-03	7.38E-04	5.72E-03	3.02E-04	1.11E-03	8.20E-05	--	3.87E-06
Degassing														
Refilling	0.05	0.05	0.05	0.05	0.05	0.01	2.65E-03	5.05E-04	3.91E-03	2.07E-04	7.58E-04	5.61E-05	1.21E-05	2.65E-06
Degassing	0.06	0.06	0.06	0.06	0.06	0.04	9.17E-03	1.75E-03	0.01	7.16E-04	2.63E-03	1.94E-04	4.20E-05	9.17E-06
TOTAL [7]								**5.95E-03**	**0.05**	**2.43E-03**	**8.92E-03**	**6.61E-04**	**5.41E-05**	**3.12E-05**
SO_2 [8]														
Roof Landings														
Standing Idle	2.16	2.16	1.77	2.16	0.96	--	0.02	0.05	0.40	0.02	0.08	5.77E-03	--	0.25
Refilling	0.83	0.83	0.83	0.83	0.83	--	0.83	0.01	0.10	5.32E-03	0.02	1.44E-03	--	0.07
Degassing														
Refilling	0.83	0.83	0.83	0.83	0.83	0.83	0.83	8.89E-03	0.07	3.64E-03	0.01	9.87E-04	2.13E-04	4.66E-05
Degassing	0.03	0.03	0.03	0.03	0.03	5.58E-03	1.22E-03	0.03	0.24	0.01	0.05	3.42E-03	7.39E-04	1.61E-04
TOTAL [7]								**0.10**	**0.81**	**0.04**	**0.16**	**0.01**	**9.52E-04**	**0.32**

Notes:

[1] Emission factors for VCU-4 obtained from stack testing of vapor combustors at the site. The maximum emission factor from any of the test runs is conservatively used to estimate emissions.
Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers.

[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 µm in diameter, therefore $PM = PM_{10} = PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).

[3] Higher Heating Value from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010.

[4] Lb/hr values for VOC and SO2 are from Table E-9 and Table E-11.
Standing idle VOC losses are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by 12 hours. This assumes that a roof is landed for at least half a day.
Refilling VOC losses are the total uncontrolled VOC filling losses (lb/tank/event) divided by the refilling duration.
Degassing VOC emissions are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by the degassing duration.
NO_X, CO, and PM emissions are calculated based on the VOCs to Control Device (lb/hr) × Heating Value of Product (Btu/lb) × Emission factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
SO2 emissions are calculated in Table E-9 and Table E-11.

[5] Calculated according to the following equations:
[a] Standing Idle and Refilling: (Standing Idle Losses/Tank or Refilling Losses/Tank) × Controlled Roof Landing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table E-9 for Roof Landing Episodes/Year/Tank and Number of Tanks
[b] Degassing: (Uncontrolled VOC Standing Idle Losses/Tank/Episode - Uncontrolled VOC Venting Losses/Tank/Episode) × Controlled Degassing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table E-11 for Degassing Episodes/Year/Tank and Number of Tanks

[6] Calculated according to the following equations:
[a] Standing Idle and Refilling: Annual VOCs from Standing Idle and Refilling (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
[b] Degassing: Annual VOCs from Degassing (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu

[7] The totals are calculated as follows: Tpy: Sum of Roof Landings (Standing Idle + Refilling) and Degassing (Refilling + Degassing).

[8] Annual emissions are calculated in Table E-9 and Table E-11.

Conversions:

2,000 lb/ton
1,000,000 Btu/MMBtu

Table E-17
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs: VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside, LLC

Input	VCU-4	PORTVC	Unit
NOx Emission Factor [1]	0.10	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	7.45E-03	lb/MMBtu
DRE	99.9%	99.9%	%
Heating Value of Product [3]	20,007	20,007	Btu/lb

VOCs to Control Device

Activity	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks
	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]				(tpy) [5]			
Roof Landings								
Standing Idle	101.83	101.83	83.36	45.26	4.89	37.88	2.00	0.54
Refilling	418.51	418.51	418.51	418.51	6.55	50.73	2.68	0.73
Degassing								
Refilling	418.51	418.51	418.51	418.51	4.48	34.71	1.83	0.50
Degassing	63.14	63.14	63.14	63.14	1.93	14.95	0.79	0.21

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
The other tanks do not store condensate.

Combustion Emissions

Activity	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks
	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]				(tpy)			
NOx [6]								
Roof Landings								
Standing Idle	0.20	0.20	0.17	0.09	0.02	0.15	8.01E-03	2.17E-03
Refilling	0.84	0.84	0.84	0.84	0.01	0.10	5.36E-03	1.46E-03
Degassing								
Refilling	0.84	0.84	0.84	0.84	8.96E-03	0.07	3.67E-03	9.96E-04
Degassing	0.13	0.13	0.13	0.13	3.86E-03	0.03	1.58E-03	4.29E-04
TOTAL [7]					**0.05**	**0.35**	**0.02**	**5.05E-03**
CO [6]								
Roof Landings								
Standing Idle	0.14	0.14	0.11	0.06	0.01	0.10	5.35E-03	1.45E-03
Refilling	0.56	0.56	0.56	0.56	8.76E-03	0.07	3.58E-03	9.73E-04
Degassing								
Refilling	0.56	0.56	0.56	0.56	5.99E-03	0.05	2.45E-03	6.66E-04
Degassing	0.08	0.08	0.08	0.08	2.58E-03	0.02	1.06E-03	2.87E-04
TOTAL [7]					**0.03**	**0.24**	**0.01**	**3.38E-03**

Table E-17
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs: VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside, LLC

Activity	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks	467k BBL Tanks		373k BBL Tanks	202k BBL Tanks
	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]				(tpy)			
$PM/PM_{10}/PM_{2.5}$ [6]								
Roof Landings								
Standing Idle	0.02	0.02	0.01	6.75E-03	7.29E-04	5.65E-03	2.98E-04	8.10E-05
Refilling	0.06	0.06	0.06	0.06	9.76E-04	7.56E-03	3.99E-04	1.08E-04
Degassing								
Refilling	0.06	0.06	0.06	0.06	6.68E-04	5.17E-03	2.73E-04	7.42E-05
Degassing	9.41E-03	9.41E-03	9.41E-03	9.41E-03	2.88E-04	2.23E-03	1.18E-04	3.20E-05
TOTAL [7]					**2.66E-03**	**0.02**	**1.09E-03**	**2.96E-04**
SO_2 [8]								
Roof Landings								
Standing Idle	0.18	0.18	0.15	0.08	4.31E-03	0.03	1.76E-03	4.79E-04
Refilling	0.37	0.37	0.37	0.37	5.77E-03	0.04	2.36E-03	6.41E-04
Degassing								
Refilling	0.37	0.37	0.37	0.37	3.95E-03	0.03	1.62E-03	4.39E-04
Degassing	6.01E-03	6.01E-03	6.01E-03	6.01E-03	1.70E-03	0.01	6.96E-04	1.89E-04
TOTAL [7]					**0.02**	**0.12**	**6.44E-03**	**1.75E-03**

Notes:

[1] Emission factors for VCU-4 obtained from stack testing of vapor combustors at the site. The maximum emission factor from any of the test runs is conservatively used to estimate emissions.
Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers.

[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 μm in diameter, therefore $PM = PM_{10} = PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).

[3] Higher Heating Value from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.

[4] Lb/hr values for VOC and SO2 are from Table E-10 and Table E-12.
Standing idle VOC losses are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by 12 hours. This assumes that a roof is landed for at least half a day.
Refilling VOC losses are the total uncontrolled VOC filling losses (lb/tank/event) divided by the refilling duration.
Degassing VOC emissions are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by the degassing duration.
NO_X, CO, and PM emissions are calculated based on the VOCs to Control Device (lb/hr) × Heating Value of Product (Btu/lb) × Emission factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
SO2 emissions are calculated in Table E-10 and Table E-12.

[5] Calculated according to the following equations:
[a] Standing Idle and Refilling: (Standing Idle Losses/Tank or Refilling Losses/Tank) × Controlled Roof Landing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table E-10 for Roof Landing Episodes/Year/Tank and Number of Tanks
[b] Degassing: (Uncontrolled VOC Standing Idle Losses/Tank/Episode - Uncontrolled VOC Venting Losses/Tank/Episode) × Controlled Degassing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table E-12 for Degassing Episodes/Year/Tank and Number of Tanks

[6] Calculated according to the following equations:
[a] Standing Idle and Refilling: Annual VOCs from Standing Idle and Refilling (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
[b] Degassing: Annual VOCs from Degassing (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu

[7] The totals are calculated as follows: Tpy: Sum of Roof Landings (Standing Idle + Refilling) and Degassing (Refilling + Degassing).

[8] Annual emissions are calculated in Table E-10 and Table E-12.

Conversions:

2,000 lb/ton
1,000,000 Btu/MMBtu

Table E-18
Tank Truck Loading Emissions (EPNs: VCU-4 and TRUCKLOAD)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Data Type		Units and/or Constants	Truck Loading Crude	Truck Loading Condensate	Notes
Loading Data	Vessel Type		Truck	Truck	
	Vapor Collection Efficiency	%	99.2%	99.2%	Per NSR Permit No. 122362, S.C. 21.D., tank trucks must comply with testing in MACT Subpart R.
	Vapor Destruction Efficiency	%	99.9%	99.9%	
	Saturation Factor	S	0.6	0.6	
Constants, Conversions, and Combustion Device Emission Factors	Loading Loss Equation	-	12.46	12.46	
	gal/bbl	BC	42	42	
	lbs/ton	-	2000	2000	
	H_2S Emission Factor	lb H_2S/lb VOC	0.0054	0.0019	
	NO_X Emission Factor	lb/MMBtu	0.1	0.1	
	CO Emission Factor	lb/MMBtu	0.07	0.07	
	$PM/PM_{10}/PM_{2.5}$ Emission Factor	lb/MMBtu	0.0075	0.0075	
Product Physical Property Data	Vapor Molecular Weight	M (lb/lb-mole)	50	65	
	Vapor Heat Content	Btu/lb	19,580	20,007	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
	Maximum True Vapor Pressure	P (psia)	11.00	11.00	
	Annual Average True Vapor Pressure	P (psia)	8.74	8.70	
	Maximum Product Loading Temperature	T (°R)	555	555	
	Annual Average Product Loading Temperature	T (°R)	530	530	
VOC Loading Loss Factor	Short-term Loading Loss (Total)	lb/1,000 gal loaded	7.41	9.63	= 12.46 × SPM/T (maximum)
	Annual Loading Loss (Total)	lb/1,000 gal loaded	6.16	7.97	= 12.46 × SPM/T (average)
Product Throughput	Short-term	bbl/hr	900	900	
		gal/hr	37,800	37,800	= bbl/hr × 42 gal/bbl
	Annual	bbl/yr	26,400	26,400	
		gal/yr	1,108,800	1,108,800	= bbl/yr × 42 gal/bbl
Uncollected Loading Loss Emissions (EPN TRUCKLOAD)	Maximum Short-term VOC	lb/hr	2.24	2.91	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × (1 - Vapor Collection Efficiency %)
	Annual VOC	tpy	0.03	0.04	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × (1 - Vapor Collection Efficiency %)
	Maximum Short-term H_2S	lb/hr	0.01	5.41E-03	= Maximum Short-term VOC (lb/hr) × H_2S Emission Factor (lb H_2S/lb VOC)
	Annual H_2S	tpy	1.48E-04	6.56E-05	= Annual VOC (tpy) × H_2S Emission Factor (lb H_2S/lb VOC)
Collected and Controlled Emissions (EPN VCU-4)	Maximum Short-term VOC	lb/hr	0.28	0.36	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Annual VOC	tpy	3.39E-03	4.39E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Maximum Short-term H_2S	lb/hr	1.51E-03	6.70E-04	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Annual H_2S	tpy	1.84E-05	8.14E-06	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Maximum Short-term NO_X	lb/hr	0.54	0.72	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual NO_X	tpy	6.64E-03	8.77E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term CO	lb/hr	0.36	0.48	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual CO	tpy	4.44E-03	5.87E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term $PM/PM_{10}/PM_{2.5}$	lb/hr	0.04	0.05	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual $PM/PM_{10}/PM_{2.5}$	tpy	4.95E-04	6.54E-04	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term SO_2	lb/hr	2.83	1.26	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) × Vapor Collection Efficiency % ÷ MW H_2S (34.08 lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (64 lb/lb-mole)
	Annual SO_2	tpy	0.03	0.02	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % ÷ MW H_2S (34.08 lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (64 lb/lb-mole)

Table E-19
Equipment MSS (EPN: MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

Emissions Summary

Source	FIN	EPN	EPN MSS-ATM: Crude VOC lb/hr	Crude VOC tons/year	Crude H_2S lb/hr	Crude H_2S tons/year	Condensate VOC lb/hr	Condensate VOC tons/year	Condensate H_2S lb/hr	Condensate H_2S tons/year
Equipment MSS Vapors Vented	EQVENT, EQDEGAS	MSS-ATM, MSS-CONT	78.54	0.84	0.09	9.13E-04	102.11	1.09	0.04	4.06E-04
Equipment Draining	EQDRAIN	MSS-ATM	15.47	0.23	0.02	2.54E-04	20.12	0.30	7.47E-03	1.13E-04
Equipment Vapor Space Emissions Atmosphere Post Control	EQDGSATM	MSS-ATM	6.88	0.14	7.47E-03	1.51E-04	8.94	0.18	3.32E-03	6.69E-05
Equipment MSS Refilling	EQREFATM, EQREFILL	MSS-ATM, MSS-CONT	47.13	0.50	0.05	5.48E-04	61.27	0.66	0.02	2.43E-04

*Vapors routed to control are not included in this table. EPNs MSS-ATM and MSS-CONT are listed for completeness in this table for activities that have vapors emitted to both the atmosphere and control. The above emissions are only for EPN MSS-ATM

Equipment ID	Variable	Units	Equation	Pump	Filter/Meter/ Valve	Vessels & Piping	Crude Emission Totals	Pump	Filter/Meter/ Valve	Vessels & Piping	Condensate Emission Totals
Short-Term Venting/Draining/Refilling Events		events/hr		5	5	1		5	5	1	
Annual Venting/Draining/Refilling Events		events/yr		144	70	44		144	70	44	
Molecular Weight of Vapor [1]	MW_V	lb/lb-mole		50	50	50		65	65	65	
Daily Avg. Liquid Surface Temp.	T	°F		95	95	95		95	95	95	
		°R	°F + 459.67	554.67	554.67	554.67		554.67	554.67	554.67	
Vapor Pressure at Max. Storage Temp.	VP	psia	Must be less than 11.0 psia according to 30 TAC §106.478	11.00	11.00	11.00		11.00	11.00	11.00	
Volume	V	ft^3/event		85.00	85.00	4,363.00		85.00	85.00	4,363.00	
Equipment MSS Vapors Vented (EPNs MSS-ATM and MSS-CONT)											
Vented to Control		Yes/No		No	No	Yes		No	No	Yes	
Moles [2]	n	moles/event	n = PV/RT	0.16	0.16	8.06		0.16	0.16	8.06	
Vented VOC Emissions (No control: FIN EQDEGAS, EPN MSS-ATM, Control: FIN EQDEGAS, EPN MSS-CONT)		lb/hr [3]	n (moles/event) × MW_V (lb/lb-mole) × Short-term events (events/hr)	39.27	39.27	403.16	***78.54***	51.05	51.05	524.10	***102.11***
		tons/year [3]	n (moles/event) × MW_V (lb/lb-mole) × Annual events (events/year) × Equipment count ÷ 2,000 lb/ton	0.57	0.27	8.87	***0.84***	0.74	0.36	11.53	***1.09***
Equipment Draining (FIN EQDRAIN, EPN MSS-ATM)											
Equipment Draining VOC Loading Loss [4]	L_L	lb/1,000 gals loaded	AP-42 Section 5.2, Equation (1): L_L = 12.46 × SPM/T, where S = 0.6 from Table 5.2-1 for tank trucks and rail cars, submerged loading: dedicated normal service	7.41	7.41	7.41		9.64	9.64	9.64	
Equipment Draining VOC Loss		lb/event	Equipment volume: 20% of pump, filter, meter, and valve volume, 2.5% of piping volume Volume (ft^3/event) × 7.48 gal/ft^3 × L_L (lb/1,000 gal) ÷ 1,000 × 20% or 2.5%	0.94	0.94	6.05		1.23	1.23	7.86	
Equipment Draining VOC Emissions (FIN EQDRAIN, EPN MSS-ATM)		lb/hr	VOC Loss (lb/event) × Short-term events (events/hr)	4.71	4.71	6.05	***15.47***	6.13	6.13	7.86	***20.12***
		tons/year	VOC Loss (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	0.07	0.03	0.13	***0.23***	0.09	0.04	0.17	***0.30***
Equipment Vapor Space Emissions (Vapor Space Volume > 10 ft^3) to Atmosphere Post Control (EPN MSS-ATM)											
Vented Vapor Space VOC Emissions after Control (10,000 ppm)		lb/event	10,000 parts per million ÷ 1,000,000 parts/million parts × Volume (ft^3/event) × MW_V (lb/lb-mole) ÷ 379 ft^3/lb-mole	0.11	0.11	5.76		0.15	0.15	7.48	
Venting Duration		hrs/event		1.0	1.0	1.0		1.0	1.0	1.0	
Vented Vapor Space VOC Emissions after Control (10,000 ppm) (FIN EQDGSATM, EPN MSS-ATM)		lb/hr	Vented VOC (lb/event) ÷ Event Duration (hrs/event) × Short-term events (events/hr)	0.56	0.56	5.76	***6.88***	0.73	0.73	7.48	***8.94***
		tons/year	Vented VOC (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	8.07E-03	3.92E-03	0.13	***0.14***	0.01	5.10E-03	0.16	***0.18***

Table E-19
Equipment MSS (EPN: MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Crude H_2S Emission Factor	**0.0011**	**lb H_2S/lb VOC**
Condensate H_2S Emission Factor	**0.0004**	**lb H_2S/lb VOC**

Emissions Summary

Source	FIN	EPN	EPN MSS-ATM							
			Crude				Condensate			
			VOC		H_2S		VOC		H_2S	
			lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year
Equipment MSS Vapors Vented	EQVENT, EQDEGAS	MSS-ATM, MSS-CONT	78.54	0.84	0.09	9.13E-04	102.11	1.09	0.04	4.06E-04
Equipment Draining	EQDRAIN	MSS-ATM	15.47	0.23	0.02	2.54E-04	20.12	0.30	7.47E-03	1.13E-04
Equipment Vapor Space Emissions Atmosphere Post Control	EQDGSATM	MSS-ATM	6.88	0.14	7.47E-03	1.51E-04	8.94	0.18	3.32E-03	6.69E-05
Equipment MSS Refilling	EQREFATM, EQREFILL	MSS-ATM, MSS-CONT	47.13	0.50	0.05	5.48E-04	61.27	0.66	0.02	2.43E-04

*Vapors routed to control are not included in this table. EPNs MSS-ATM and MSS-CONT are listed for completeness in this table for activities that have vapors emitted to both the atmosphere and control. The above emissions are only for EPN MSS-ATM

Equipment ID	Variable	Units	Equation	Pump	Filter/Meter/ Valve	Vessels & Piping	Crude Emission Totals	Pump	Filter/Meter/ Valve	Vessels & Piping	Condensate Emission Totals
Equipment MSS Refilling (EPNs MSS-ATM and MSS-CONT)											
Vented to Control		Yes/No		No	No	Yes		No	No	Yes	
Equipment VOC Loading Loss	L_L	lb/1,000 gals loaded	AP-42 Section 5.2, Equation (1): $L_L = 12.46 \times SPM/T$, where S = 0.6 from Table 5.2-1 for tank trucks and rail cars, submerged loading: dedicated normal service	7.41	7.41	7.41		9.64	9.64	9.64	
Recovery VOC Loss		lb/event	Volume (ft^3/event) × 7.48 gal/ft^3 × L_L (lb/1,000 gal) ÷ 1,000	4.71	4.71	241.93		6.13	6.13	314.50	
Recovery VOC Emissions (No control: FIN EQREFILL, EPN MSS-ATM, Control: FIN EQREFILL, EPN MSS-CONT)		lb/hr [3]	VOC Loss (lb/event) × Short-term events (events/hr)	23.57	23.57	241.93	***47.13***	30.64	30.64	314.50	***61.27***
		tons/year [3]	VOC Loss (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	0.34	0.16	5.32	***0.50***	0.44	0.21	6.92	***0.66***

Notes:
[1] From EPA TANKS 4.09d: Crude oil (RVP 5) for crude and gasoline (RVP 11.5) for condensate.
[2] Where: P = vapor pressure, psia
V = volume, ft^3/event
R = Ideal Gas Constant, 10.731 psia-ft^3/lb-mole-°R
T = temperature, °R
[3] Total is the sum of uncontrolled emissions.
[4] Where: L_L = loading loss, lb/10^3 gal of liquid loaded
S = saturation factor from AP-42 Section 5.2, Table 5.2-1
P = true vapor pressure, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R

Conversions:

2,000	lb/ton
7.48	gal/ft^3
379	ft^3/lb-mole at 60°F and 14.7 psia
1,000,000	parts/million parts

Table E-20
Air Mover and Vacuum Truck MSS Emissions (EPNs: MSS-ATM and MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Value	Units
Loading Temperature	95	°F
	554.67	°R
Saturation Factor [1]	1.45	
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

EPN	Truck Type and Load Method	Material	TVP [2] (psia)	Vapor MW [3] (lb/lb-mole)	Loading Loss [4] (lb/1,000 gal)	Loading Loss (lb/1,000 bbl)	Liquid Throughput [5] (bbl/hr)	Liquid Throughput [5] (bbl/yr)	Vapor Displacement [6] (bbl/hr)	Vapor Displacement [6] (bbl/yr)	Uncontrolled Vacuum Truck VOC Emissions [7] (lb/hr)	Uncontrolled Vacuum Truck VOC Emissions [7] (tons/year)	Control Efficiency [8]	Controlled Vacuum Truck VOC Emissions [9] (lb/hr)	Controlled Vacuum Truck VOC Emissions [9] (tons/year)	Vacuum Truck H_2S Emissions [10] (lb/hr)	Vacuum Truck H_2S Emissions [10] (tons/year)
Crude																	
MSS-CONT	Air Mover & Vacuum Mover - Thermal Control	High VP Products	11.00	50	17.91	752.43	85	6,800	170	13,600	127.91	5.12	99.9%	0.13	5.12E-03	1.39E-04	5.56E-06
MSS-CONT	Air Mover & Vacuum Mover - Carbon Control	High VP Products	11.00	50	--	--	85	6,800	170	13,600	--	--	100 ppm	0.01	5.04E-04	1.37E-05	5.47E-07
MSS-ATM	Air Mover & Vacuum Mover - No Control	Low VP Materials	0.5	130	2.12	88.92	85	6,800	170	13,600	15.12	0.60	0%	--	--	0.02	6.57E-04
Condensate																	
MSS-CONT	Air Mover & Vacuum Mover - Thermal Control	High VP Products	11.00	65	23.29	978.15	85	6,800	170	13,600	166.29	6.65	99.9%	0.17	6.65E-03	6.17E-05	2.47E-06
MSS-CONT	Air Mover & Vacuum Mover - Carbon Control	High VP Products	11.00	65	--	--	85	6,800	170	13,600	--	--	100 ppm	0.02	6.55E-04	6.08E-06	2.43E-07
MSS-ATM	Air Mover & Vacuum Mover - No Control	Low VP Materials	0.5	130	2.12	88.92	85	6,800	170	13,600	15.12	0.60	0%	--	--	5.61E-03	2.24E-04

Emissions Summary

EPN	VOC Maximum Short-term Emissions [11] (lb/hr)	VOC Annual Emissions [12] (tons/year)	H_2S Maximum Short-term Emissions [11] (lb/hr)	H_2S Annual Emissions [12] (tons/year)
MSS-CONT	0.17	7.31E-03	1.39E-04	6.10E-06
MSS-ATM	15.12	0.60	0.02	6.57E-04

Calculation for Carbon Control Emissions

$$Vapor\ Displacement\ (bbl/hr) \times Conversion\left(\frac{42\ gal}{bbl}\right) \div Conversion\left(\frac{7.48\ gal}{ft^3}\right) \div Conversion\left(\frac{379\ ft^3}{lb-mole}\right) \times MW_V\left(\frac{lb}{lb-mole}\right) \times \frac{100\ parts}{million\ parts} \div Conversion\left(\frac{1{,}000{,}000\ parts}{million\ parts}\right) = VOC\ \ lb/hr$$

Notes:

[1] Thermal Control: Saturation factor = 1.45, from AP-42 Section 5.2, Table 5.2-1, factor for tank trucks and rail cars, splash loading: dedicated normal service.
[2] Products with vapor pressures ≤ 0.5 psia do not require control according to BACT for Vacuum Trucks in Section IV.3.A.(3) of the TCEQ's MSS Guidance (September 2012). Low VP materials at the site are considered to be settled materials from tank bottom or storage containers.
[3] Vapor MW for "high VP products" is based on crude oil RVP 5, from Table 7.1-2 in AP-42 Section 7.1. Vapor MW for "low VP materials" is based on distillate fuel oil no. 2, from Table 7.1-2 In AP-42 Section 7.1.
[4] Calculated using Equation 1 from AP-42 Section 5.2:
L_L = 12.46*(SPM/T)
Where: L_L = loading loss, lb/1,000 gal liquid loaded
S = saturation factor, dimensionless
P = true vapor pressure of liquid loaded, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R
[5] Annual throughput assumes that each loading takes one hour.
[6] Assumed that the vapor volume displaced is twice the liquid throughput according to Section IV.2.A. of the TCEQ's MSS Guidance (September 2012).
[7] Calculated according to the following equation: Loading loss (lb/1,000 bbl) ÷ 1,000 × Liquid Throughput (bbl/hr or bbl/yr) ÷ 2,000 lb/ton (for tons/year calculation only)
[8] Control efficiency based on the breakthrough concentration of the carbon control according to Section IV.3.A.(3) of the TCEQ's MSS Guidance (September 2012).
[9] Carbon controlled emissions based on the breakthrough concentration: Vapor Displacement (bbl/hr) × 42 gal/bbl × 7.48 gal/ft^3 ÷ 379 ft^3/lb-mole × MW (lb/lb-mole) × 100 ppm ÷ 1,000,000 parts/million parts
[10] Thermal control emissions calculated according to the following equation: Loading loss (lb/1,000 bbl) ÷ 1,000 × Liquid Throughput (bbl/hr or bbl/yr) × H_2S Emission Factor (lb H_2S/lb VOC) × (1 - Control Efficiency %) ÷ 2,000 lb/ton (for tons/year calculation only)
Carbon control emissions calculated according to the following equation: Controlled vacuum truck VOC emissions (lb/hr or tons/year) × H_2S Emission Factor (lb H_2S/lb VOC)
No control emissions calculated according to the following equation: Uncontrolled vacuum truck VOC emissions (lb/hr or tons/year) × H_2S Emission Factor (lb H_2S/lb VOC)
[11] Hourly emissions for EPN MSS-CONT are the maximum of the high vapor pressure products (thermal control and carbon control). Hourly emissions for EPN MSS-ATM are from low vapor pressure products (no control). The maximum of crude and condensate is used to represent maximum hourly emissions.
[12] Annual emissions from EPN MSS-CONT are the maximum sum of the high vapor pressure products (thermal control and carbon control). Annual emissions from EPN MSS-ATM are from low vapor pressure products (no control). The maximum of crude and condensate is used to represent maximum annual emissions.

Conversions:

42 gal/bbl
°R = °F + 459.67
2,000 lb/ton
7.48 gal/ft^3
379 ft^3/lb-mole at 60°F and 14.7 psia
1,000,000 parts/million parts

Table E-21
Frac Tank Emissions (EPN: MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Parameter	Value	Units
Loading Temperature	95	°F
	554.67	°R
Saturation Factor [1]	0.6	
Pumping Rate	50	bbl/hr
Frac Tank Volume	18,000	gal/tank
Simultaneous Loadings	10	tanks/hr
Annual Loading	17	tanks/year
Simultaneous Breathing	10	tanks/hr
DRE	99.9%	
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

Working Losses per Tank

							VOC		H_2S	
Product	Load Type	MW [2] (lb/lb-mole)	Maximum VP (psia)	Loading Loss Factor [3] (lb/1,000 gal)	Short-term Throughput (gal/hr)	Annual Throughput (gal/yr)	Short-term Emissions [4] (lb/hr)	Annual Emissions [4] (tons/year)	Short-term Emissions [4] (lb/hr)	Annual Emissions [4] (tons/year)
Crude	Submerged Load	50	11.00	7.41	2,100	306,000	**0.02**	**1.13E-03**	**1.69E-05**	**1.23E-06**
Condensate	Submerged Load	65	11.00	9.64	2,100	306,000	**0.02**	**1.47E-03**	**7.51E-06**	**5.47E-07**

Breathing Emissions per Tank

			Maximum VOC Breathing Losses [6] (lb/month)		Maximum H_2S Breathing Losses [6] (lb/month)	
Tank	Contents	Standing Time [5] (hrs/mo)	lb/month-tank	lb/hr-tank	lb/month-tank	lb/hr-tank
Frac Tank	Crude	720	1,043.31	1.45E-03	1.13	1.57E-06
Frac Tank	Condensate	720	621.52	8.63E-04	0.23	3.20E-07

Emissions Summary

	Crude				Condensate			
Emissions Source	Maximum Short-term VOC Emissions (lb/hr)	Annual VOC Emissions (tons/year)	Maximum Short-term H_2S Emissions (lb/hr)	Annual H_2S Emissions (tons/year)	Maximum Short-term VOC Emissions (lb/hr)	Annual VOC Emissions (tons/year)	Maximum Short-term H_2S Emissions (lb/hr)	Annual H_2S Emissions (tons/year)
Working Losses [7]	0.16	0.02	1.69E-04	2.09E-05	0.20	0.03	7.51E-05	9.31E-06
Breathing Losses [8], [9]	0.01	8.87E-03	1.57E-05	9.63E-06	8.63E-03	5.28E-03	3.20E-06	1.96E-06
TOTAL	**0.16**	**0.03**	**1.69E-04**	**3.06E-05**	**0.20**	**0.03**	**7.51E-05**	**1.13E-05**

Notes:
[1] Saturation factor = 0.6, from Table 5.2-1, factor for tank trucks and rail cars, submerged loading: dedicated normal service
[2] MW from Table 7.1-2 in AP-42 Section 7.1, crude is based on crude oil RVP 5, condensate is based on gasoline RVP 11.5
[3] Calculated using Equation 1 from AP-42 Section 5.2:
L_L = 12.46*(SPM/T)
Where: L_L = loading loss, lb/1,000 gal liquid loaded
S = saturation factor, dimensionless
P = true vapor pressure of liquid loaded, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R
[4] Short-term Emissions: Loading Loss Factor (lb/1,000 gal) × Short-term Throughput (gal/hr) × (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only)
Annual Emissions: Loading Loss Factor (lb/1,000 gal) × Annual Throughput (gal/yr) ÷ Conversion (2,000 lb/ton) × (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only)
[5] Based on 30 days per month.
[6] Maximum monthly breathing loss from TANKS 4.0.9d. Hourly emissions calculated by dividing monthly losses by hours per month× (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only).
[7] Assumes 10 tanks can be filled in the worst-case hour.
[8] Hourly emissions are based on 10 tanks standing idle in the worst-case hour.
[9] Annual emissions are the maximum of breathing emissions from TANKS 4.0.9d output. Assumes that no tank is full for more than 30 days
Working Losses (tons/year) = Annual Emissions (working losses per tank, tons/year) × Annual Loading (tanks/year)
Breathing Losses (tons/year) = Maximum VOC Breathing Losses (lb/month-tank) ÷ Conversion (2,000 lb/ton) × Annual Loading (tanks/year) × (1 - DRE %)

Conversions:
°R = °F + 459.67
2,000 lb/ton
24 hrs/day

Table E-22
Frac Tank Breathing Emissions (EPN: MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Month	Crude [1] (lb/mo)	Condensate [1] (lb/mo)
January	393.3034	288.6594
February	425.9941	308.3563
March	567.1329	397.0044
April	625.7493	419.6469
May	714.3594	459.0618
June	822.6998	506.9638
July	1043.3096	621.5208
August	927.0421	559.0998
September	734.5403	460.9244
October	656.5797	438.1532
November	490.8873	345.0498
December	412.5846	299.6723

Notes:
[1] From TANKS 4.0.9d output files.

Table E-23
Controlled MSS Emissions (EPN: MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Input	Value	Unit
NOx Emission Factor [1]	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	lb/MMBtu
DRE	99.9%	%
Heating Value of Crude [3]	19,580	Btu/lb
Heating Value of Condensate [3]	20,007	Btu/lb
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

	VOC (Crude) [4]		VOC (Condensate) [4]		Heat Input (Crude) [5]		Heat Input (Condensate) [5]		H_2S to Control (Crude) [6]		H_2S to Control (Condensate) [6]	
Stream	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term (MMBtu/hr)	Annual (MMBtu/yr)	Short-term (MMBtu/hr)	Annual (MMBtu/yr)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)
Equipment MSS Vapors	403.16	8.87	524.10	11.53	7.89	347.33	10.49	461.37	0.44	9.63E-03	0.19	4.28E-03
Equipment MSS Refilling	241.93	5.32	314.50	6.92	4.74	208.42	6.29	276.86	0.26	5.78E-03	0.12	2.57E-03
Air Mover and Vacuum Truck MSS	127.91	5.12	166.29	6.65	2.50	200.36	3.33	266.15	0.14	5.56E-03	0.06	2.47E-03
Frac Tanks	155.67	28.15	202.38	30.35	3.05	1,102.33	4.05	1,214.37	0.17	0.03	0.08	0.01

	VOC [7]		NO_X [8]		CO [8]		$PM/PM_{10}/PM_{2.5}$ [8]		SO_2 [9]		H_2S [10]	
Stream	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
Equipment MSS Vapors	0.52	0.01	1.05	0.02	0.70	0.02	0.08	1.72E-03	0.82	0.02	4.38E-04	9.63E-06
Equipment MSS Refilling	0.31	6.92E-03	0.63	0.01	0.42	9.26E-03	0.05	1.03E-03	0.49	0.01	2.63E-04	5.78E-06
Air Mover and Vacuum Truck MSS	0.17	6.65E-03	0.33	0.01	0.22	8.90E-03	0.02	9.92E-04	0.26	0.01	1.39E-04	5.56E-06
Frac Tanks	0.20	0.03	0.40	0.06	0.27	0.04	0.03	4.52E-03	0.32	0.06	1.69E-04	3.06E-05
Emissions [11]	**0.52**	**0.06**	**1.05**	**0.11**	**0.70**	**0.07**	**0.08**	**8.27E-03**	**0.82**	**0.10**	**4.38E-04**	**5.15E-05**

Notes:

[1] Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers

[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 µm in diameter, therefore PM = PM_{10} = $PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).

[3] Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.

[4] From Table E-19, Table E-20, and Table E-21.

[5] Heat Input (MMBtu/hr) = Short-term Vapors to Control (lb/hr) × Heating Value of Product (Btu/lb) ÷ Conversion (1,000,000 Btu/MMBtu)
Heat Input (MMBtu/yr) = Annual Vapors to Control (tpy) × Heating Value of Product (Btu/lb) ÷ Conversion (1,000,000 Btu/MMBtu) × Conversion (2,000 lb/ton)

[6] H_2S to Control (lb/hr and tpy) = Vapors to Control (lb/hr or tpy) × H_2S Emission Factor (lb H_2S/lb VOC)

[7] VOC (lb/hr and tpy) = Maximum of Crude and Condensate Vapors to Control (lb/hr or tpy) × (1 - DRE %)

[8] NO_X, CO, and $PM/PM_{10}/PM_{2.5}$ (lb/hr and tpy) = Maximum of Crude and Condensate Heat Input (MMBtu/hr or MMBtu/yr) × Emission Factor (lb/MMBtu) [÷ Conversion (2,000 lb/ton) for annual emissions]

[9] SO_2 (lb/hr and tpy) = Maximum of Crude and Condensate H_2S to Control (lb/hr or tpy) ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)

[10] H_2S (lb/hr and tpy) = Maximum of Crude and Condensate H_2S to Control (lb/hr or tpy) × (1 - DRE %)

[11] Short-term emissions are the maximum of any activity. Annual emissions are the sum of all activities.

Conversions:

1,000,000	Btu/MMBtu
2,000	lb/ton
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole

Table E-24
Miscellaneous Inherently Low Emitting Maintenance Activities (EPN: MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside, LLC

Maintenance Activity	Emissions/Event (lbs)	Events/Hr	Events/Year	VOC [1] (lb/hr) [2]	VOC [1] (tons/year) [3]
Minor Facilities (i.e., pumps, valves, piping, filters, compressors, sight glasses, etc.) with isolated volumes < 45 ft^3	10.68	2	40	21.36	0.21
Total Miscellaneous Maintenance Emissions				**21.36**	**0.21**

Notes:
[1] The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency or individual activities.
[2] VOC (lb/hr) = Emissions/event (lbs) × Events/hr
[3] VOC (tons/year) = Emissions/event (lbs) × Events/year ÷ Conversion (2,000 lb/ton)

Appendix F

REVISED EMISSION CALCULATIONS FROM PERMIT ISSUED DECEMBER 6, 2019 FOR PSD REVIEW APPLICABILITY

Table 1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		$PM/PM_{10}/PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
DOCK-2	DOCK-2	Uncollected Loading Dock No. 2	[1]	11.87	29.02	--	--	--	--	--	--	--	--	9.91E-03	0.02
DOCK-4	DOCK-4	Uncollected Loading Dock No. 4	[1]	11.87	29.02	--	--	--	--	--	--	--	--	9.91E-03	0.02
DOCK-5	DOCK-5	Uncollected Loading Dock No. 5	[1]	11.87	29.02	--	--	--	--	--	--	--	--	9.91E-03	0.02
DOCK CAP	DOCK-2, DOCK-4, DOCK-5	Uncollected Dock Emissions Cap	[2]	23.73	35.54	--	--	--	--	--	--	--	--	0.02	0.04
VCU-1	VCU-1, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCU-2	VCU-2, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCU-3	VCU-3, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCU-5	VCU-5, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCU-6	VCU-6, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCU-7	VCU-7, DOCK-2, DOCK-4, DOCK-5	Collected and Controlled Marine Loading + Pilot	[3]	10.78	26.77	8.12	26.70	2.05	5.45	0.61	3.97	7.93	33.86	4.22E-03	0.02
VCUCAP	VCU-1 to 3, VCU-5 to 7	Collected and Controlled Marine Loading + Pilot Annual Emissions Cap	[4]	21.57	36.53	43.39	37.22	11.01	8.21	3.23	5.46	33.81	63.25	0.02	0.03
T-101	T-101	Tank T-101	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-102	T-102	Tank T-102	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-103	T-103	Tank T-103	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-104	T-104	Tank T-104	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-105	T-105	Tank T-105	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-106	T-106	Tank T-106	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-107	T-107	Tank T-107	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-108	T-108	Tank T-108	[5]	9.68	4.77	--	--	--	--	--	--	--	--	0.01	5.18E-03
T-109	T-109	Tank T-109	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-110	T-110	Tank T-110	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-111	T-111	Tank T-111	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-112	T-112	Tank T-112	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-113	T-113	Tank T-113	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-114	T-114	Tank T-114	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-115	T-115	Tank T-115	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-116	T-116	Tank T-116	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-117	T-117	Tank T-117	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-118	T-118	Tank T-118	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-119	T-119	Tank T-119	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-120	T-120	Tank T-120	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-201	T-201	Tank T-201	[5]	2.03	0.52	--	--	--	--	--	--	--	--	2.21E-03	5.63E-04
T-202	T-202	Tank T-202	[5]	2.03	0.52	--	--	--	--	--	--	--	--	2.21E-03	5.63E-04
T-121	T-121	Tank T-121	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-122	T-122	Tank T-122	[5]	9.66	3.66	--	--	--	--	--	--	--	--	0.01	2.82E-03
T-123	T-123	Tank T-123	[5]	9.66	3.66	--	--	--	--	--	--	--	--	0.01	2.82E-03
T-124	T-124	Tank T-124	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-125	T-125	Tank T-125	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-126	T-126	Tank T-126	[5]	12.45	1.81	--	--	--	--	--	--	--	--	0.01	1.96E-03
T-127	T-127	Tank T-127	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-128	T-128	Tank T-128	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03

Table 1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

[highlighted cell] = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		$PM/PM_{10}/PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
T-129	T-129	Tank T-129	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-130	T-130	Tank T-130	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-131	T-131	Tank T-131	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-132	T-132	Tank T-132	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-133	T-133	Tank T-133	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-134	T-134	Tank T-134	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-135	T-135	Tank T-135	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-136	T-136	Tank T-136	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-137	T-137	Tank T-137	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-138	T-138	Tank T-138	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-139	T-139	Tank T-139	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-140	T-140	Tank T-140	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-141	T-141	Tank T-141	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-142	T-142	Tank T-142	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-143	T-143	Tank T-143	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-144	T-144	Tank T-144	[5]	8.28	3.12	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
EMERTK1	EMERTK1	Emergency Relief Tank 1		11.34	0.31	--	--	--	--	--	--	--	--	0.01	3.37E-04
EMERTK2	EMERTK2	Emergency Relief Tank 2		11.34	0.31	--	--	--	--	--	--	--	--	0.01	3.37E-04
TANKCAP	T-101 through T-144, T-201, T-202, EMERTK1, EMERTK2	Tank Cap	[6]	--	133.28	--	--	--	--	--	--	--	--	--	0.14
TRUCKLOAD	TRUCKLOAD	Uncollected Truck Loading	[7]	2.91	0.04	--	--	--	--	--	--	--	--	2.43E-03	2.97E-05
VCU-4	VCU-4, TRUCKLOAD, T-101 through T-108, T-110, and T-111	Controlled Truck Loading / Routine Tank Floating Roof Landing Emissions + Pilot	[8]	3.51	0.28	2.44	0.48	1.64	0.35	0.18	0.03	4.90	0.27	4.60E-03	3.67E-04
FUG	FUG	Equipment Fugitives		2.16	9.48	--	--	--	--	--	--	--	--	2.35E-03	0.01
PORTVC	T-109, T-112 through T-144, T-201, T-202	Portable VCU for Controlled Tank Roof Landings and Degassings + Pilot		1.57	0.45	1.71	1.16	1.14	0.76	0.13	0.06	4.33	1.18	2.15E-03	3.41E-03
MSS-CONT	*EQDEGAS*	*Equipment MSS Vapors*		*0.52*	*0.01*	*1.05*	*0.02*	*0.70*	*0.02*	*0.08*	*1.72E-03*	*0.82*	*0.02*	*4.38E-04*	*9.63E-06*
MSS-CONT	*EQREFILL*	*Equipment MSS Refilling*		*0.31*	*6.92E-03*	*0.63*	*0.01*	*0.42*	*9.26E-03*	*0.05*	*1.03E-03*	*0.49*	*0.01*	*2.63E-04*	*5.78E-06*
MSS-CONT	*AIRVACMV*	*Air Mover and Vacuum Truck MSS Emissions*		*0.17*	*6.65E-03*	*0.33*	*0.01*	*0.22*	*8.90E-03*	*0.02*	*9.92E-04*	*0.26*	*0.01*	*1.39E-04*	*5.56E-06*
MSS-CONT	*FRACTKS*	*Frac Tank Emissions*		*0.20*	*0.03*	*0.40*	*0.06*	*0.27*	*0.04*	*0.03*	*4.52E-03*	*0.32*	*0.06*	*1.69E-04*	*3.06E-05*
MSS-CONT	*MSS-CONT*	*Pilot Emissions*		*3.00E-03*	*0.01*	*0.04*	*0.17*	*0.02*	*0.10*	*2.10E-03*	*9.20E-03*	*1.62E-04*	*7.10E-04*	*--*	*--*
MSS-CONT	T-101 through T-144, T-201, T-202, EMERTK1, EMERTK2	Controlled MSS Cap	[9]	--	0.07	--	0.28	--	0.17	--	0.02	--	0.10	--	5.15E-05
MSS-ATM	*EQDEGAS*	*Equipment MSS Vapors Vented*		*102.11*	*1.09*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*0.09*	*9.13E-04*
MSS-ATM	*EQDRAIN*	*Equipment Draining*		*20.12*	*0.30*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*0.02*	*2.54E-04*
MSS-ATM	*EQDGSATM*	*Equipment Vapor Space Emissions Atmosphere Post Control*		*8.94*	*0.18*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*7.47E-03*	*1.51E-04*
MSS-ATM	*EQREFILL*	*Equipment MSS Refilling*		*61.27*	*0.66*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*0.05*	*5.48E-04*
MSS-ATM	*T-101 through T-144, T-201, T-202, EMERTK1, EMERTK2*	*Uncontrolled Venting from Storage Tank Degassing*		*257.41*	*5.38*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*0.27*	*5.85E-03*
MSS-ATM	*Miscellaneous*	*Miscellaneous Inherently Low Emitting Maintenance Activities*		*21.36*	*0.21*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*0.02*	*6.57E-04*

Table 1
Summary of Project Emissions
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

[highlighted cell] = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Emission Summary by EPN

EPN	FIN	Description	Note	VOC		NO_x		CO		$PM/PM_{10}/PM_{2.5}$		SO_2		H_2S	
				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
MSS-ATM	EQDEGAS, EQDRAIN, EQDGSATM, EQREFILL, T-101 through T-144, T-201, T-202, EMERTK1, EMERTK2	Uncontrolled MSS Emission Cap	[10]	471.20	7.82	--	--	--	--	--	--	--	--	0.45	8.37E-03
		Sitewide Emissions	**[11]**	--	**223.48**	--	**39.14**	--	**9.49**	--	**5.56**	--	**64.80**	--	**0.23**

Notes:

[1] Values per dock are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table 3 and Table 4.

[2] Values for EPN DOCK CAP are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table 3 and Table 4.

[3] Values per VCU are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table 3 and Table 4.

[4] Values for EPN VCUCAP are from either marine loading scenario 1 (all ship/ocean-going barge loading) or scenario 2 (inland barge and ship/ocean-going barge loading combination) from Table 3 and Table 4.

[5] Storage tank emissions represented are based on the maximum hourly and annual emission rates from storage of condensate and crude oil.

[6] The tank cap is based on the maximum emissions from either: 1. Condensate emissions from the 12 highest emitting tanks + remaining tanks in crude service, or 2. Crude emissions from all tanks. Maximum VOC emissions result from 12 tanks in condensate service with the remaining tanks in crude service. Maximum H_2S emissions result from all tanks in crude service.

[7] Emissions are the maximum from either crude or condensate loading from Table 17.

[8] Hourly emissions are the sum of tank truck loading and 2 tanks simultaneously landed or degassed. The worst-case emissions from crude or condensate is used as the hourly value for each activity.
Annual emissions are the sum of tank truck loading, product change roof landings, and tank degassing. The worst-case emissions from crude or condensate is used for each activity.

[9] Annual emissions are the sum of all MSS-CONT sources.

[10] Uncontrolled MSS Emission Cap is the sum of FINs EQDEGAS, EQDRAIN, EQDGSATM, EQREFILL, and T-101 through T-144, T-201, and T-202 uncontrolled venting.

[11] Sitewide emissions are the sum of EPNs DOCK CAP, VCUCAP, TANKCAP, TRUCKLOAD, VCU-4, FUG, MSS-CONT, and MSS-ATM.

Table 2
Federal Applicability Analysis
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

New Facilities

EPN	Size	VOC [1]		NO_x		CO		$PM/PM_{10}/PM_{2.5}$		SO_2		H_2S	
	(bbl)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
T-126	373,000	12.45	2.60	--	--	--	--	--	--	--	--	0.01	1.96E-03
T-127	373,000	8.28	2.60	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-128	202,000	8.28	1.81	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-129	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-130	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-131	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-132	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-133	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-134	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-135	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-136	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-137	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-138	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-139	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-140	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-141	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-142	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-143	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
T-144	467,000	8.28	2.54	--	--	--	--	--	--	--	--	8.99E-03	2.76E-03
PORTVC		1.57	0.45	1.71	1.16	1.14	0.76	0.13	0.06	4.33	1.18	2.15E-03	3.41E-03
Total		**--**	**48.15**	**--**	**1.16**	**--**	**0.76**	**--**	**0.06**	**--**	**1.18**	**--**	**0.06**

Notes:
[1] The site only needs the capacity to store condensate in 12 storage tanks. The emissions represented for tanks T-126 through T-144 are for crude.

Table 3
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 160,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.

Parameter	Basis	Value			Units		Information Source
		Ship/Ocean-Going Barge Loading					
		Crude and Condensate		Crude Only			
Product Loaded		**Condensate**	**Crude Oil**	**Crude Oil**			
Maximum Hourly Loading Rate	Per Dock	80,000	80,000	80,000	barrels/hr		Maximum loading rate is per dock.
Maximum Annual Throughput	Per Dock	201,744,000	350,400,000	350,400,000	barrels/yr		Value is the minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly loading rate (per dock) × 8,760 hr/yr × 0.5, which assumes that a dock is actively loaded at the maximum loading rate for half of the year. A dock could be operated more than half of the hours in a year at a loading rate that is less than the maximum hourly loading rate.
Maximum Hourly Capacity	Per VCU	30,000	30,000	30,000	barrels/hr		
Maximum Annual Capacity	Per VCU	201,744,000	262,800,000	262,800,000	barrels/yr		Minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly capacity (per VCU) × 8,760 hr/yr. The value for condensate is the total barrels of condensate that can be loaded annually. The crude throughput in the crude and condensate loading scenario is the difference between the maximum hourly capacity (per VCU) × 8,760 hr/yr and annual condensate loading.
Maximum Hourly Loading Rate	Total	160,000	160,000	160,000	barrels/hr		Maximum loading rate is combined for controlled products at Docks 1 through 3 and is not per dock.
Maximum Annual Throughput	Total	201,744,000	487,836,000	689,580,000	barrels/yr		Annual condensate throughput is limited to 12 of the 467k bbl tanks tanks in condensate service. In the crude and condensate service scenario, crude throughput is the total tanks' throughput less the condensate throughput. In the crude only scenario, the throughput assumes that all of the tanks' throughput could be crude.
Hydrogen Sulfide Content		10	10	10	ppmw		
Saturation Factor (S)		0.2	0.2	0.2	lb/1,000 gal		Saturation factor obtained from API Manual of Petroleum Measurement Standards Chapter 19.5, *Atmospheric hydrocarbon emissions from marine vessel transfer operations* (1st edition, Sep 2009). Factor for ship/ocean-going barge loading is from Table 2 - ship or ocean barge, volatile, uncleaned.
Physical Properties							
Maximum True Vapor Pressure (P_{max})		11.00	11.00	11.00	psia		Average TVP calculated using Figure 7.1-14b from AP-42, Chapter 7, Section 7.1 - Organic Liquids Storage Tanks (November 2006). Maximum TVP is limited to 11.00 psia.
Average True Vapor Pressure (P_{ave})		8.70	8.74	8.74	psia		
Vapor Molecular Weight (M)		65	50	50	lb/lb-mole		From EPA TANKS 4.09d. RVP 7 Gasoline used as a surrogate for condensate, RVP 5 crude used for crude oil.
Maximum Loading Temperature (T_{max})		95	95	95	deg. F		
		555	555	555	deg. R		
Average Loading Temperature (T_{ave})		70	70	70	deg. F		
		530	530	530	deg. R		
Uncontrolled Loading Loss							
VOC Emission Factor at Maximum Loading Temp. (LLmax)		3.21	2.47	2.47	lb/1,000 gals loaded		Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLmax = 12.46 x S x P_{max} x M / T_{max}
VOC Emission Factor at Average Loading Temp. (LLave)		2.66	2.05	2.05	lb/1,000 gals loaded		Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLavg = 12.46 x S x P_{avg} x M / T_{avg}
Maximum Hourly Loading Loss	Per Dock	10,787	8,298	8,298	lb/hr		Maximum hourly loading rate (per dock) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per Dock	11,261	15,117	15,117	tpy		Maximum annual throughput (per dock) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Per VCU	4,045	3,112	3,112	lb/hr		Maximum hourly capacity (per VCU) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per VCU	11,261	11,338	11,338	tpy		Maximum annual capacity (per VCU) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Total	21,574	16,595	16,595	lb/hr		Maximum hourly loading rate (total) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Total	11,261	21,047	29,751	tpy		Maximum annual throughput (total) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Vapor Collection System							
Collection Efficiency		99.89%	99.89%	99.89%	%		Vapor collection efficiency.
Vapor Combustion (EPNs VCU-1 to VCU-3, VCU-5 to VCU-7)							
Destruction Removal Efficiency (DRE)		99.9%	99.9%	99.9%	%		Destruction Removal Efficiency (DRE)

Table 3
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC = Updated as part of retroactive PSD analysis associated with January 2021 permitting action
REVISED JANUARY 2021

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 160,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.

Parameter	Basis	Value			Units	Information Source
		Ship/Ocean-Going Barge Loading				
		Crude and Condensate		Crude Only		
Product Loaded		Condensate	Crude Oil	Crude Oil		
Uncombusted Loading Emissions (EPNs VCU-1 to VCU-3, VCU-5 to VCU-7)						
VOC Hourly Emissions	Per VCU (VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)	10.78	8.29	8.29	lb/hr	Maximum hourly loading loss (per dock) (lb/hr) x (CE (%)) x (1 - DRE) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		11.25	11.33	11.33	tpy	Annual loading loss (per VCU) (tpy) x (CE (%)) x (1 - DRE) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		1.50E-03	3.38E-03	3.38E-03	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
H_2S Annual Emissions		4.18E-03	0.01	0.01	tpy	H_2S Emissions (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
SO_2 Hourly Emissions		2.82	6.34	6.34	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		7.84	23.10	23.10	tpy	SO_2 (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
VOC Hourly Emissions	Total (VCUCAP)	21.55	16.58	16.58	lb/hr	Maximum hourly loading loss (total) (lb/hr) x (CE (%)) x (1 - DRE) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		11.25	21.02	29.72	tpy	Annual loading loss (total) (tpy) x (CE (%)) x (1 - DRE) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		8.00E-03	0.02	0.02	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
H_2S Annual Emissions		4.18E-03	0.02	0.03	tpy	H_2S Emissions (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
SO_2 Hourly Emissions		15.02	33.81	33.81	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		7.84	42.87	60.60	tpy	SO_2 (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
Uncaptured Emissions		DOCK-2, DOCK-4, DOCK-5				
VOC Hourly Emissions	Per Dock (DOCK-2, DOCK-4, DOCK-5)	11.87	9.13	9.13	lb/hr	VOC Hourly Emissions (per dock) (lb/hr) = Maximum Hourly Loading loss (per dock) (lb/hr) * (1 - CE (%))
VOC Annual Emissions		12.39	16.63	16.63		VOC Annual Emissions (per dock) (tpy) = Maximum Hourly Loading loss (per dock) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		4.41E-03	9.91E-03	9.91E-03	lb/hr	H_2S Hourly Emission (per dock) (lb/hr) = VOC Hourly Emissions (per dock) (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		4.60E-03	0.02	0.02		H_2S Annual Emission (per dock) (tpy) = VOC Annual Emissions (per dock) (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
VOC Hourly Emissions	Total (DOCK CAP)	23.73	18.25	18.25	lb/hr	VOC Hourly Emissions (total) (lb/hr) = Maximum Hourly Loading loss (total) (lb/hr) * (1 - CE (%))
VOC Annual Emissions		12.39	23.15	32.73	tpy	VOC Annual Emissions (total) (tpy) = Maximum Hourly Loading loss (total) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		8.81E-03	0.02	0.02	lb/hr	H_2S Hourly Emission (total) (lb/hr) = VOC Hourly Emissions (total) (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		4.60E-03	0.03	0.04	tpy	H_2S Annual Emission (total) (tpy) = VOC Annual Emissions (total) (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
Heat Content of Vapor						
Heat Content of Vapor		20,007	19,580	19,580	Btu/lb	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
Hourly Heat Rate to VCU	Per VCU	80.84	60.86	60.86	MMBtu/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		450,084	443,510	443,510	MMBtu/yr	Annual loading loss (per VCU) (tpy) x 2,000 (lb/ton) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Hourly Heat Rate to VCU	Total	431.16	324.58	324.58	MMBtu/hr	Maximum hourly loading loss (total) (lb/hr) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		450,084	823,288	1,163,758	MMBtu/yr	Annual loading loss (total) (tpy) x 2,000 (lb/ton) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
H_2S Emission Calculation Parameters						
VOC K Value		0.7483	0.7483	0.7483	Dimensionless	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value		19.628	19.628	19.628	Dimensionless	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
Liquid MW		92	207	207	lb/lb-mol	From EPA TANKS 4.09d. MW of crude oil is for Crude Oil (RVP 5). MW of condensate is Gasoline (RVP 11).
H_2S Liquid/Vap MW		34.08	34.08	34.08	lb/lb-mol	Standard References
Liquid Mole Fraction H_2S		0.0000	0.0001	0.0001	Conversion	Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S		0.0005	0.0012	0.0012	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC		0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor		0.0004	0.0011	0.0011	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Table 3
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

This table evaluates emissions from the scenario where only ships/ocean-going barges are loaded at the site's docks in the short-term. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this ship/ocean-going barge-only loading scenario, the maximum loading at any single dock is 80,000 bbl/hr. The maximum short-term loading across all the docks is 160,000 bbl/hr. Each VCU has a maximum capacity of 30,000 bbl/hr. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate.

Scenario: All controlled ship loading.
Emissions Summary

EPN	FIN	Description	Pollutant	Emission Factor (lb/MMBtu)	Emission Rates (lb/hr)	Emission Rates (tpy)	Information Source
VCU-1 to VCU-3, VCU-5 to VCU-7	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	---	10.78	22.57	Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_x (max)	0.1000	8.08	--	NO_x emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_x (avg)	0.0500	--	22.34	
			CO (max)	0.0250	2.02	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.0100	--	4.47	
			$PM/PM_{10}/PM_{2.5}$	0.0075	0.60	3.33	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	---	6.34	30.94	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	---	3.38E-03	0.02	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
VCUCAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	---	21.55	32.27	Maximum of 3 vessels can be loaded per hour. Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_x (max)	0.1000	43.12	--	NO_x emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_x (avg)	0.0500	--	31.83	
			CO (max)	0.0250	10.78	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.0100	--	6.37	
			$PM/PM_{10}/PM_{2.5}$	0.0075	3.21	4.74	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	---	33.81	60.60	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	---	0.02	0.03	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2, DOCK-4, DOCK-5	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading fugitives	VOC	--	11.87	29.02	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	9.91E-03	0.02	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK CAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading fugitives	VOC	--	23.73	35.54	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	0.02	0.04	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.

Conversions:

42 gal/bbl
2,000 lb/ton

Table 4
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Parameter	Basis	Value: Ship/Ocean-Going Barge Loading		Value: Inland Barge Loading	Value: Ship/Ocean-Going Barge Loading	Value: Inland Barge Loading	Units	Information Source
		Crude and Condensate			Crude Only			
Product Loaded		**Condensate**	**Crude Oil**	**Condensate**	**Crude Oil**	**Crude Oil**		
Maximum Hourly Loading Rate	Per Dock	--	--	5,000	--	5,000	barrels/hr	Maximum loading rate for inland barges is per dock.
Number of Simultaneous Vessels Loaded	Per Dock	--	--	3	--	3		One inland barge loaded per dock.
Maximum Annual Throughput	Per Dock	151,744,000	350,400,000	50,000,000	350,400,000	20,000,000	barrels/yr	Maximum annual barge loading is 50,000,000 bbl/yr. For condensate, the remaining ship/ocean-going barge annual loading volume is the total annual condensate volume through the site, less the maximum annual barge loading rate. For the crude only scenario, ship/ocean-going barge loading is the total annual volume through the site, less the maximum annual barge loading rate.
Maximum Hourly Capacity	Per VCU	--	--	15,000	--	15,000	barrels/hr	Minimum of: 1. maximum VCU capacity (30,000 bbl/hr) and 2. maximum hourly loading rate (per dock) × number of simultaneous vessels loaded.
Maximum Annual Capacity	Per VCU	151,744,000	262,800,000	50,000,000	262,800,000	20,000,000	barrels/yr	Minimum of: 1. maximum annual throughput (total), and 2. the maximum hourly capacity (per VCU) × 8,760 hr/yr. The value for condensate is the total barrels of condensate that can be loaded annually. The crude throughput in the crude and condensate loading scenario is the difference between the maximum hourly capacity (per VCU) × 8,760 hr/yr and annual condensate loading.
Maximum Hourly Loading Rate	Total	--	--	15,000	--	15,000	barrels/hr	Maximum hourly loading rate (per dock) × Number of simultaneous vessels loaded
Maximum Annual Throughput	Total	151,744,000	487,836,000	50,000,000	669,580,000	20,000,000	barrels/yr	Annual condensate throughput is limited to 12 of the 467k bbl tanks tanks in condensate service. In the crude and condensate service scenario, crude throughput is the total tanks' throughput less the condensate throughput. In the crude only scenario, the throughput assumes that all of the tanks' throughput could be crude.
Hydrogen Sulfide Content		10	10	10	10	10	ppmw	
Saturation Factor (S)		0.2	0.2	0.5	0.2	0.5	lb/1,000 gal	Saturation factors obtained from API Manual of Petroleum Measurement Standards Chapter 19.5, *Atmospheric hydrocarbon emissions from marine vessel transfer operations* (1st edition, Sep 2009). Factor for inland barges is from Table 2 - shallow draft barge, volatile, uncleaned - gasoline and crude oil loading. Factor for ship/ocean-going barge loading is from Table 2 - ship or ocean barge, volatile, uncleaned.
Physical Properties								
Maximum True Vapor Pressure (P_{max}) [1]		11.00	11.00	11.00	11.00	11.00	psia	TVP calculated using Figure 7.1-14b from AP-42, Chapter 7, Section 7.1 - Organic Liquids Storage Tanks (November 2006).
Average True Vapor Pressure (P_{ave})		8.70	8.74	8.70	8.74	8.74	psia	
Vapor Molecular Weight (M)		65	50	65	50	50	lb/lb-mole	From EPA TANKS 4.09d. RVP 7 Gasoline used as a surrogate for condensate, RVP 5 crude used for crude oil.
Maximum Loading Temperature (T_{max})		95	95	95	95	95	deg. F	
		555	555	555	555	555	deg. R	
Average Loading Temperature (T_{ave})		70	70	70	70	70	deg. F	
		530	530	530	530	530	deg. R	
Uncontrolled Loading Loss								
VOC Emission Factor at Maximum Loading Temp. (LLmax)		3.21	2.47	8.03	2.47	6.17	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLmax = 12.46 x S x P_{max} x M / T_{max}
VOC Emission Factor at Average Loading Temp. (LLave)		2.66	2.05	6.64	2.05	5.14	lb/1,000 gals loaded	Uncontrolled Loading Loss calculation based on AP-42 Chapter 5, Section 5.2 *Transportation and Marketing of Petroleum Liquids* (July 2008), Equation 1. LLavg = 12.46 x S x P_{avg} x M / T_{avg}
Maximum Hourly Loading Loss	Per Dock	--	--	1,685	--	1,297	lb/hr	Maximum hourly throughput (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per Dock	8,470	15,117	6,977	15,117	2,157	tpy	Maximum annual throughput (per dock) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Per VCU	--	--	5,056	--	3,890	lb/hr	Maximum hourly capacity (per VCU) (bbl/hr) x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Per VCU	8,470	11,338	6,977	11,338	2,157	tpy	Maximum annual capacity (per VCU) (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Maximum Hourly Loading Loss	Total	--	--	5,056	--	3,890	lb/hr	Maximum hourly throughput (bbl/hr) x Number of Simultaneous Vessels Loaded x (42 gal/bbl) x LLmax (lb/1,000 gal loaded)
Annual Loading Loss	Total	8,470	21,047	6,977	28,888	2,157	tpy	Maximum annual throughput (bbl/yr) x (42 gal/bbl) x LLave (lb/1,000 gal loaded) / (2,000 lb/ton)
Vapor Collection System								
Collection Efficiency		99.89%	99.89%	100%	99.89%	100%	%	Vapor collection efficiency.
Vapor Combustion (EPNs VCU-1 to VCU-3, VCU-5 to VCU-7)								
Destruction Removal Efficiency (DRE)		99.9%	99.9%	99.9%	99.9%	99.9%	%	Destruction Removal Efficiency (DRE)

Table 4
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

[yellow box] = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Parameter	Basis	Value: Ship/Ocean-Going Barge Loading		Value: Inland Barge Loading	Value: Ship/Ocean-Going Barge Loading	Value: Inland Barge Loading	Units	Information Source
		Crude and Condensate			Crude Only			
Product Loaded		Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil		
Uncombusted Loading Emissions (EPNs VCU-1 to VCU-3, VCU-5 to VCU-7)								
VOC Hourly Emissions	Per VCU (VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)	--	--	5.06	--	3.89	lb/hr	Maximum hourly loading loss (per dock) (lb/hr) x (CE (%)) x (1 - DRE) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		8.46	11.33	6.98	11.33	2.16	tpy	Annual loading loss (per VCU) (tpy) x (CE (%)) x (1 - DRE) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		--	--	1.88E-03	--	4.22E-03	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
H_2S Annual Emissions		3.14E-03	0.01	2.59E-03	0.01	2.34E-03	tpy	H_2S Emissions (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
SO_2 Hourly Emissions		--	--	3.53	--	7.93	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (per VCU) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		5.90	23.10	4.86	23.10	4.40	tpy	SO_2 (tpy) = Annual Loading Loss (per VCU) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
VOC Hourly Emissions	Total (VCUCAP)	--	--	5.06	--	3.89	lb/hr	Maximum hourly loading loss (total) (lb/hr) x (CE (%)) x (1 - DRE) + Maximum hourly loading loss (lb/hr) x (1 - CE (%))
VOC Annual Emissions		8.46	21.02	6.98	28.86	2.16	tpy	Annual loading loss (total) (tpy) x (CE (%)) x (1 - DRE) + Annual loading loss (tpy) x (1 - CE (%))
H_2S Hourly Emissions		--	--	1.88E-03	--	4.22E-03	lb/hr	H_2S Emissions (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
H_2S Annual Emissions		3.14E-03	0.02	2.59E-03	0.03	2.34E-03	tpy	H_2S Emissions (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * Vapor Collection Efficiency (%) * (1 - DRE)
SO_2 Hourly Emissions		--	--	3.53	--	7.93	lb/hr	SO_2 (lb/hr) = Maximum Hourly Loading Loss (total) (lb/hr) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
SO_2 Annual Emissions		5.90	42.87	4.86	58.85	4.40	tpy	SO_2 (tpy) = Annual Loading Loss (total) (tpy) * H_2S Emission Factor (lb H_2S/lb VOC) * (64 lb/mol SO_2 / 34.08 lb/mol H_2S) * Vapor Collection Efficiency (%) * 100% H_2S to SO_2 Conversion Efficiency (%))
Uncaptured Emissions		DOCK-2, DOCK-4, DOCK-5		No Emissions	DOCK-2, DOCK-4, DOCK-5	No Emissions		
VOC Hourly Emissions	Per Dock (DOCK-2, DOCK-4, DOCK-5)	--	--	--	--	--	lb/hr	
VOC Annual Emissions		9.32	16.63	--	16.63	--	tpy	VOC Annual Emissions (per dock) (tpy) = Maximum Hourly Loading loss (per dock) (tpy) * (1 - CE (%))
H_2S Hourly Emissions		--	--	--	--	--	lb/hr	
H_2S Annual Emissions		3.46E-03	0.02	--	0.02	--	tpy	H_2S Annual Emission (per dock) (tpy) = VOC Annual Emissions (per dock) (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
VOC Hourly Emissions	Total (DOCK CAP)	--	--	--	--	--	lb/hr	VOC Hourly Emissions (lb/hr) = Maximum Hourly Loading loss (lb/hr) * (1 - CE (%))
VOC Annual Emissions		9.32	23.15	--	31.78	--	tpy	VOC Annual Emissions (tpy) = Maximum Hourly Loading loss (tpy) * (1 - CE (%))
H_2S Hourly Emissions		--	--	--	--	--	lb/hr	H_2S Hourly Emission (lb/hr) = VOC Hourly Emissions (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
H_2S Annual Emissions		3.46E-03	0.03	--	0.03	--	tpy	H_2S Annual Emission (tpy) = VOC Annual Emissions (lb/hr) x (1 - CE) x H_2S Emission Factor (lb H_2S/lb VOC)
Heat Content of Vapor								
Heat Content of Vapor		20,007	19,580	20,007	19,580	19,580	Btu/lb	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
Hourly Heat Rate to VCU	Per VCU	--	--	1.01	--	0.76	MMBtu/hr	Maximum hourly loading loss (per VCU) (lb/hr) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		338,536	443,510	279,178	443,510	84,475	MMBtu/yr	Annual loading loss (per VCU) (tpy) x 2,000 (lb/ton) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Hourly Heat Rate to VCU	Total	--	--	1.01	--	0.76	MMBtu/hr	Maximum hourly loading loss (lb/hr) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
Annual Heat Rate to VCU		338,536	823,288	279,178	1,130,006	84,475	MMBtu/yr	Annual loading loss (tpy) x 2,000 (lb/ton) x (CE) x Heat content of VOC (Btu/lb) / 1,000,000
H_2S Emission Calculation Parameters								
VOC K Value		0.7483	0.7483	0.7483	0.7483	0.7483	Dimensionless	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value		19.628	19.628	19.628	19.628	19.628	Dimensionless	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
Liquid MW		92	207	92	207	207	lb/lb-mol	From EPA TANKS 4.09d. MW of crude oil is for Crude Oil (RVP 5). MW of condensate is Gasoline (RVP 11).
H_2S Liquid/Vap MW		34.08	34.08	34.08	34.08	34.08	lb/lb-mol	Standard References
Liquid Mole Fraction H_2S		0.0000	0.0001	0.0000	0.0001	0.0001	Conversion	Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S		0.0005	0.0012	0.0005	0.0012	0.0012	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC		0.7483	0.7483	0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor		0.0004	0.0011	0.0004	0.0011	0.0011	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Table 4
Marine Loading Emission Calculations (EPNs DOCK-2, DOCK-4, DOCK-5, VCU-1, VCU-2, VCU-3, VCU-5, VCU-6, VCU-7)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

(highlighted) = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

This table evaluates emissions from the scenario where only inland barges are loaded at the site's docks in the short-term. The site will not load more than 50,000,000 bbl/yr of product into inland barges. The remainder of the site's throughput will be into ships/ocean-going barges, which is considered in this scenario for annual emissions. The site can have a condensate throughput volume of up to 12 of its largest tanks at 3 turnovers per month; therefore, there are two product scenarios which can occur: 1. All product through the site is crude, and 2. Product through the site is a combination of crude and condensate. In this inland barge-only short-term loading scenario, the maximum loading at any single dock is 5,000 bbl/hr and three (3) vessels can be loaded simultaneously. The maximum marine loading vapors to be sent to control can be controlled by just one of the permanent VCUs, which has a maximum capacity of 30,000 bbl/hr each. The worst-case vapors sent to any VCU in the short-term will be either all crude or all condensate. The worst-case annual emissions are from either: 1. maximum inland barge loading of crude with the remainder in ships/ocean-going barges, or 2. maximum inland barge loading of condensate, remaining condensate throughput loaded into ships/ocean-going barges, and the remaining throughput through the site is crude loaded into ships/ocean-going barges.

Scenario: Short-term - All controlled barge loading. Annual - Maximum barge loading and remaining capacity ship/ocean-going barge loading.

Emissions Summary

EPN	FIN	Description	Pollutant	Emission Factor	Emission Rates		Information Source
				(lb/MMBtu)	(lb/hr) [2], [3]	(tpy) [4]	
VCU-1 to VCU-3, VCU-5 to VCU-7	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	---	5.06	26.76	Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.1000	0.10	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.0500	--	26.53	
			CO (max)	0.0250	0.03	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.0100	--	5.31	
			$PM/PM_{10}/PM_{2.5}$	0.0075	7.54E-03	3.95	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, per VCU from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	---	7.93	33.86	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	---	4.22E-03	0.02	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, per VCU from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, per VCU from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
VCUCAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading	VOC	---	5.06	36.46	Maximum of 3 vessels can be loaded per hour. Short-term: Maximum of uncombusted loading emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			NO_X (max)	0.1000	0.10	--	NO_X emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			NO_X (avg)	0.0500	--	36.03	
			CO (max)	0.0250	0.03	--	CO emission factor obtained from stack testing of the vapor combustors. The maximum emission factor from any of the test runs is conservatively used to estimate emissions. Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			CO (avg)	0.0100	--	7.21	
			$PM/PM_{10}/PM_{2.5}$	0.0075	7.54E-03	5.37	$PM/PM_{10}/PM_{2.5}$ emission factor obtained from AP-42 Chapter 1, Section 1.4 - Natural Gas Combustion (July, 1998). Short-term: Maximum of heat content of vapor, hourly heat rate to VCU, total from crude and condensate (MMBtu/hr) × EF (lb/MMBtu) Annual: Maximum of heat content of vapor, annual heat rate to VCU, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario (MMBtu/yr) × EF (lb/MMBtu) ÷ 2,000 lb/ton
			SO_2	---	7.93	63.25	Short-term: Maximum of uncombusted loading emissions, SO_2 hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, SO_2 annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	---	4.22E-03	0.03	Short-term: Maximum of uncombusted loading emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncombusted loading emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK-2, DOCK-4, DOCK-5	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading fugitives	VOC	--	0.00E+00	25.95	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	0.00E+00	0.02	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, per dock from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, per dock from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
DOCK CAP	DOCK-2, DOCK-4, DOCK-5	Collected and controlled loading fugitives	VOC	--	0.00E+00	32.47	Short-term: Maximum of uncaptured emissions, VOC hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, VOC annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.
			H_2S	--	0.00E+00	0.03	Short-term: Maximum of uncaptured emissions, H_2S hourly emissions, total from crude and condensate. Annual: Maximum of uncaptured emissions, H_2S annual emissions, total from 1. the sum of condensate + crude scenario, and 2. crude only scenario.

Conversions:

42 gal/bbl
2,000 lb/ton

Table 5
VCU Pilot Emissions (EPNs VCU-1, VCU-2, VCU-3, VCU-4, VCU-5, VCU-6, VCU-7, PORTVC, and MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

EPNs VCU-1 through VCU-7

Natural Gas Flow Rate	130	scf/hr-pilot
Number of Pilots per VCU	3	
Number of VCUs	7	

Pollutant [1],[2]	Emission Factor		Total Flow Rate	Emissions per VCU	
	Value	Units	scf/hr	lb/hr [3]	tons/year [4]
VOC	5.5	lb/10^6 scf	390	2.15E-03	9.40E-03
NO_X	100	lb/10^6 scf	390	0.04	0.17
CO	84	lb/10^6 scf	390	0.03	0.14
SO_2	0.6	lb/10^6 scf	390	2.34E-04	1.02E-03
$PM/PM_{10}/PM_{2.5}$	7.6	lb/10^6 scf	390	2.96E-03	0.01

VCUCAP Emissions

Pollutant	Maximum Short-term Emissions	Annual Emissions
	lb/hr	tons/year
VOC	0.02	0.07
NO_X	0.27	1.20
CO	0.23	1.00
SO_2	1.64E-03	7.17E-03
$PM/PM_{10}/PM_{2.5}$	0.02	0.09

EPNs PORTVC and MSS-CONT

Propane Flow Rate	1	gal/hr-pilot
Number of Pilots	3	

Pollutant [5]	Emission Factor		Total Flow Rate	Emissions	
	Value	Units	gal/hr	lb/hr [6]	tons/year [7]
VOC	1.0	lb/10^3 gal	3	3.00E-03	0.01
NO_X	13	lb/10^3 gal	3	0.04	0.17
CO	7.5	lb/10^3 gal	3	0.02	0.10
SO_2 [8]	0.054	lb/10^3 gal	3	1.62E-04	7.10E-04
$PM/PM_{10}/PM_{2.5}$	0.7	lb/10^3 gal	3	2.10E-03	9.20E-03

Notes:
[1] NO_X and CO factors are from AP-42 Section 1.4, Table 1.4-1, factors for uncontrolled small boilers.
[2] VOC, SO_2, and PM factors from AP-42 Section 1.4, Table 1.4-2. SO_2 factor assumes all sulfur in the fuel is converted to SO_2. Total PM factor is for PM < 1 µm in diameter; therefore, PM = PM_{10} = $PM_{2.5}$.
[3] Calculated according to the following equation: Emission factor (lb/10^6 scf) × 1 MMscf/10^6 scf × Total Flow Rate (scf/hr).
[4] Calculated according to the following equation: Emission factor (lb/10^6 scf) × 1 MMscf/10^6 scf × Total Flow Rate (scf/hr) × 8,760 hrs/year ÷ 2,000 lb/ton.
[5] Criteria pollutant factors are from AP-42 Section 1.5, Table 1.5-1, factors for commercial boilers. SO_2 factor assumes all sulfur in the fuel is converted to SO_2. Used the factor for PM, Total and assumed that PM = PM_{10} = $PM_{2.5}$.
[6] Calculated according to the following equation: Emission factor (lb/10^3 gal) × Total Flow Rate (gal/hr) ÷ 1,000.
[7] Calculated according to the following equation: Emission factor (lb/10^3 gal) × Total Flow Rate (gal/hr) ÷ 1,000 × 8,760 hrs/year ÷ 2,000 lb/ton.
[8] Emission factor is 0.10S, where S is the sulfur content in grains per 100 ft^3 gas vapor. Based on 0.54 gr S/100 scf (Haneke, B., *A National Methodology and Emission Inventory for Residential Fuel Combustion* , https://www3.epa.gov/ttnchie1/conference/ei12/area/haneke.pdf).

Conversions:

2,000	lb/ton
8,760	hrs/year
1,000,000	scf/MMscf
2.2046	lb/kg
1,000	gal/10^3 gal

Table 6

Storage Tank Emissions - Crude Oil (EPNs T-101 to T-144, T-201, T-202, EMERTK1, EMERTK2)

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Input Parameters

Parameter	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	Units	Information Source
Tank Type:	IFR	IFR	IFR	IFR	IFR	IFR		
Tanks:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-101, T-102, T-104, T-105, T-107, T-108	T-126	RT-1, RT-2	T-201, T-202		
Tank Capacity	467,000	373,000	310,000	202,000	12,600	1,000	bbl	
Diameter, D	210	190	210	140	46	21.5	ft	
H_2S Content	10	10	10	10	10	10	ppmw	
Hourly Throughput	40,000	40,000	40,000	40,000	12,600	1,000	bbl/hr-tk	
Annual Throughput	16,812,000	13,428,000	11,160,000	7,272,000	25,200	36,000	bbl/yr-tk	
Rim Seal Factor, K_R	0.6	0.6	5.8	0.6	0.6	5.8	lb-mole/ft-yr	467k, 373k, 202k, and 12.6k BBL Tanks: Factor for welded tanks with a primary mechanical-shoe seal with a rim-mounted secondary seal, from AP-42 Section 7.1, Table 7.1-8 (Nov 2006). 310k and 1k BBL Tanks: Factor for welded tanks with a primary mechanical-shoe seal only, from AP-42 Section 7.1, Table 7.1-8 (Nov 2006).
Deck Fitting Factor, F_F	264.23	354.48	401.87	230.67	107.04	93.88	lb-mole/yr	Based on tank drawings.
Deck Seam Length Factor, S_D	--	--	--	--	--	--	ft/ft^2	Applies to bolted decks only
Number of Columns, N_C	9	19	22	9	1	0	--	Based on tank drawings.
Column Diameter, F_C	1.0	1.0	1.0	1.0	1.0	1.0	ft	According to Note 3 for AP-42 Section 7.1, Eqn. (2-4) (Nov 2006), F_C = 1.0 if column construction details are not known.
Shell Clingage, C_S	0.006	0.006	0.006	0.006	0.006	0.006	bbl/1000 ft^2	Factor for crude oil in a tank with a light rust shell condition, from AP-42 Section 7.1, Table 7.1-10 (Nov 2006).
Product Factor, K_C	0.40	0.40	0.40	0.40	0.40	0.40	--	AP-42 Section 7.1 , Equation (2-2) (Nov 2006) variables, K_C = 0.4 for crude oils, 1.0 for other organic liquids.
Liquid MW	207	207	207	207	207	207	lb/lb-mole	From EPA TANKS 4.09d.
Vapor MW	50	50	50	50	50	50	lb/lb-mole	From EPA TANKS 4.09d.
Max True Vapor Pressure, P_{max}	11.00	11.00	11.00	11.00	11.00	11.00	psia	Storage of crude oil will not exceed 11 psia based on surface liquid temperature inside the storage tank.
Ave True Vapor Pressure, P_{avg}	8.74	8.74	8.74	8.74	8.74	8.74	psia	Calculated using Figure 7.1-13b from AP-42, Section 7.1 - Organic Liquids Storage Tanks (November 2006). RVP = 11, T = 70°F.
Vapor Function (Hourly), P*	0.33	0.33	0.33	0.33	0.33	0.33	--	AP-42 Section 7.1, Equation (2-3) (Nov 2006): $(P_{max}/14.7 \text{ psia})/((1+(1-(P_{max}/14.7 \text{ psia}))^{0.5})^2)$
Vapor Function (Annual), P*	0.22	0.22	0.22	0.22	0.22	0.22	--	AP-42 Section 7.1, Equation (2-3) (Nov 2006): $(P_{avg}/14.7 \text{ psia})/((1+(1-(P_{avg}/14.7 \text{ psia}))^{0.5})^2)$
Liquid Density	7.10	7.10	7.10	7.10	7.10	7.10	lb/gal	Liquid Density of crude oil from AP-42 Section 7.1, Table 7.1-2, crude oil (RVP 5) (Nov 2006).
Short-term Emissions (lb/hr)								
Rim Seal Loss, L_R	0.10	0.09	0.92	0.06	0.02	0.09	lb/hr	AP-42 Section 7.1, Equation (2-2) (Nov 2006): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Hourly) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Fitting Loss, L_F	0.20	0.27	0.30	0.17	0.08	0.07	lb/hr	AP-42 Section 7.1, Equation (2-5) (Nov 2006): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Hourly) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Seam Loss, L_D	0.00	0.00	0.00	0.00	0.00	0.00	lb/hr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	7.98	9.30	8.45	12.22	11.24	1.87	lb/hr	AP-42 Section 7.1, Equation (2-4) (Nov 2006): [0.943 x Hourly Throughput (bbl/hr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]

Table 6

Storage Tank Emissions - Crude Oil (EPNs T-101 to T-144, T-201, T-202, EMERTK1, EMERTK2)

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Input Parameters

Parameter	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	Units	Information Source
Tank Type:	IFR	IFR	IFR	IFR	IFR	IFR		
Annual Emissions (lb/yr)								
Rim Seal Loss, L_R	559.17	505.91	5,405.26	372.78	122.48	553.40	lb/yr	AP-42 Section 7.1, Equation (2-2) (Nov 2006): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Annual) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Fitting Loss, L_F	1,172.60	1,573.12	1,783.43	1,023.67	475.02	416.62	lb/yr	AP-42 Section 7.1, Equation (2-5) (Nov 2006): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Annual) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Seam Loss, L_D	0.00	0.00	0.00	0.00	0.00	0.00	lb/yr	Welded deck EFRs and IFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	3,353.87	3,123.00	2,358.49	2,220.78	22.49	67.26	lb/yr	AP-42 Section 7.1, Equation (2-4) (Nov 2006): [0.943 x Annual Throughput (bbl/yr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]
Maximum Storage Tank Temperature	95	95	95	95	95	95	°F	
Average Storage Tank Temperature	70	70	70	70	70	70	°F	
VOC K Value	0.7483	0.7483	0.7483	0.7483	0.7483	0.7483	--	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value	19.628	19.628	19.628	19.628	19.628	19.628	--	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
H_2S Liquid/Vap MW	34.08	34.08	34.08	34.08	34.08	34.08	lb/lb-mole	Standard References
Liquid Mole Fraction H_2S	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	Conversion	Liquid weight concentration x crude liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC	0.7483	0.7483	0.7483	0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Storage Tank Emission Calculations

EPN	Description	VOC [1]		H_2S [2]	
		lb/hr	tpy	lb/hr	tpy
T-103, T-106, T-109 through T-121, T-124, T-125, and T-127 through T-144	467,000-bbl Tanks	8.28	2.54	8.99E-03	2.76E-03
T-122 and T-123	373,000-bbl Tanks	9.66	2.60	0.01	2.82E-03
T-101, T-102, T-104, T-105, T-107, T-108	310,000-bbl Tanks	9.68	4.77	0.01	5.18E-03
T-126	202,000-bbl Tanks	12.45	1.81	0.01	1.96E-03
EMERTK1, EMERTK2	Emergency Relief Tanks	11.34	0.31	0.01	3.37E-04
T-201 and T-202	1,000-bbl Tanks	2.03	0.52	2.21E-03	5.63E-04

Notes:

[1] VOC Emission (lb/hr) = Rim Seal Loss, L_R (lb/hr) + Deck Fitting Loss, L_F (lb/hr) + Deck Seam Loss, L_D (lb/hr) + Withdrawal Loss, L_{WD} (lb/hr)

VOC Emission (tpy) = [Rim Seal Loss, L_R (lb/yr) + Deck Fitting Loss, L_F (lb/yr) + Deck Seam Loss, L_D (lb/yr) + Withdrawal Loss, L_{WD} (lb/yr)] * 1 ton / 2,000 lb

[2] H_2S Emissions (lb/hr) = VOC emissions (lb/hr) * H_2S Emission Factor (lb H_2S / lb VOC)

H_2S Emissions (tpy) = VOC emissions (tpy) * H_2S Emission Factor (lb H_2S / lb VOC)

Table 7

Storage Tank Emissions - Condensate (EPNs T-103, T-106, T-109 to T-144, EMERTK1, EMERTK2)

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Input Parameters

Parameter	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	Units	Information Source
Tank Type:	IFR	IFR	IFR		
Tanks:	T-103, T-106, T-109 to T-121, T-124, T-125, T-127 to T-144	T-122, T-123	T-126		
Tank Capacity	467,000	373,000	202,000	bbl	
Diameter, D	210	190	140	ft	
H_2S Content	10	10	10	ppmw	
Hourly Throughput	40,000	40,000	40,000	bbl/hr-tk	
Annual Throughput	16,812,000	13,428,000	7,272,000	bbl/yr-tk	
Rim Seal Factor, K_R	0.6	0.6	0.6	lb-mole/ft-yr	Factor for welded tanks with a primary mechanical-shoe seal with a rim-mounted secondary seal, from AP-42 Section 7.1, Table 7.1-8 (Nov 2006).
Deck Fitting Factor, F_F	264.23	354.48	230.67	lb-mole/yr	Based on tank drawings.
Deck Seam Length Factor, S_D	--	--	--	ft/ft^2	Applies to bolted decks only
Number of Columns, N_C	9	19	9	--	Based on tank drawings.
Column Diameter, F_C	1.0	1.0	1.0	ft	According to Note 3 for AP-42 Section 7.1, Eqn. (2-4) (Nov 2006), F_C = 1.0 if column construction details are not known.
Shell Clingage, C_S	0.0015	0.0015	0.0015	bbl/1,000 ft^2	Factor for gasoline in a tank with a light rust shell condition, from AP-42 Section 7.1, Table 7.1-10 (Nov 2006).
Product Factor, K_C	1.00	1.00	1.00	--	AP-42 Section 7.1 , Equation (2-2) (Nov 2006) variables, K_C = 0.4 for crude oils, 1.0 for other organic liquids.
Liquid MW	92	92	92	lb/lb-mole	From EPA TANKS 4.09d for gasoline (RVP 11.5).
Vapor MW	65	65	65	lb/lb-mole	From EPA TANKS 4.09d for gasoline (RVP 11.5).
Max True Vapor Pressure, P_{max}	11.00	11.00	11.00	psia	Storage of condensate will not exceed 11 psia based on surface liquid temperature inside the storage tank.
Avg True Vapor Pressure, P_{avg}	8.70	8.70	8.70	psia	Calculated using Figure 7.1-14b from AP-42, Section 7.1 - Organic Liquids Storage Tanks (November 2006). RVP = 13.5, T = 70°F.
Vapor Function (Hourly), P*	0.33	0.33	0.33	--	AP-42 Section 7.1, Equation (2-3) (Nov 2006): $(P_{max}/14.7\ psia)/((1+(1-(P_{max}/14.7\ psia))^{0.5})^2)$
Vapor Function (Annual), P*	0.22	0.22	0.22	--	AP-42 Section 7.1, Equation (2-3) (Nov 2006): $(P_{avg}/14.7\ psia)/((1+(1-(P_{avg}/14.7\ psia))^{0.5})^2)$
Liquid Density	5.60	5.60	5.60	lb/gal	Liquid Density of condensate from AP-42 Section 7.1, Table 7.1-2, gasoline (RVP 11.5) (Nov 2006).
Short-term Emissions (lb/hr)					
Rim Seal Loss, L_R	0.31	0.28	0.21	lb/hr	AP-42 Section 7.1, Equation (2-2) (Nov 2006): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Hourly) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Fitting Loss, L_F	0.65	0.87	0.57	lb/hr	AP-42 Section 7.1, Equation (2-5) (Nov 2006): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Hourly) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C) / 8,760 hours / yr
Deck Seam Loss, L_D	0.00	0.00	0.00	lb/hr	Welded deck EFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	1.57	1.83	2.41	lb/hr	AP-42 Section 7.1, Equation (2-4) (Nov 2006): [0.943 x Hourly Throughput (bbl/hr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]

Table 7

Storage Tank Emissions - Condensate (EPNs T-103, T-106, T-109 to T-144, EMERTK1, EMERTK2)

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Input Parameters

Parameter	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	Units	Information Source
Tank Type:	IFR	IFR	IFR		
Annual Emissions (lb/yr)					
Rim Seal Loss, L_R	1,803.58	1,631.81	1,202.39	lb/yr	AP-42 Section 7.1, Equation (2-2) (Nov 2006): Rim Seal Factor (K_R, lb-mole/ft-yr) x Vapor Function (Annual) (P*) x Diameter (D, ft) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Fitting Loss, L_F	3,782.22	5,074.07	3,301.84	lb/yr	AP-42 Section 7.1, Equation (2-5) (Nov 2006): Deck Fitting Factor (F_F, lb-mole/yr) x Vapor Function (Annual) (P*) x Vapor MW (lb/lb-mole) x Product Factor (K_C)
Deck Seam Loss, L_D	0.00	0.00	0.00	lb/yr	Welded deck EFRs do not have deck seam losses
Withdrawal Loss, L_{WD}	661.33	615.80	437.90	lb/yr	AP-42 Section 7.1, Equation (2-4) (Nov 2006): [0.943 x Annual Throughput (bbl/yr) x Liquid Density (lb/gal) x Shell Clingage (C_S, bbl/1,000 ft^2) / Diameter (D, ft)] x [1+ (Number of Columns (N_C) x Column Diameter (F_C, ft)) / Diameter (D, ft)]
Maximum Storage Tank Temperature	95	95	95	°F	
Average Storage Tank Temperature	70.0	70.0	70.0	°F	
VOC K Value	0.7483	0.7483	0.7483	--	Vapor pressure of the liquid / 14.7 psia (atmospheric)
H_2S K Value	19.628	19.628	19.628	--	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
H_2S Liquid/Vap MW	34.08	34.08	34.08	lb/lb-mole	Standard References
Liquid Mole Fraction H_2S	0.0000	0.0000	0.0000	Conversion	Liquid weight concentration x Condensate liquid MW / H_2S liquid MW
Vapor Mole Fraction H_2S	0.0005	0.0005	0.0005	Conversion	Liquid mole fraction H_2S x H_2S K Value
Vapor Mole Fraction VOC	0.7483	0.7483	0.7483	Conversion	Liquid mole fraction VOC x VOC K Value
H_2S Emission Factor	0.0004	0.0004	0.0004	lb H_2S/lb VOC	Vapor mole fraction H_2S / Vapor mole fraction VOC / VOC Vapor MW x H_2S Vapor MW

Storage Tank Emission Calculations

EPN	Description	VOC [1]		H_2S [2]	
		lb/hr	tpy	lb/hr	tpy
T-103, T-106, T-109 through T-121, T-124, T-125, and T-127 through T-144	467,000-bbl Tanks	2.53	3.12	9.41E-04	1.16E-03
T-122 and T-123	373,000-bbl Tanks	2.99	3.66	1.11E-03	1.36E-03
T-126	202,000-bbl Tanks	3.18	2.47	1.18E-03	9.17E-04

Notes:

[1] VOC Emission (lb/hr) = Rim Seal Loss, L_R (lb/hr) + Deck fitting Loss, L_F (lb/hr) + Deck Seam Loss, L_D (lb/hr) + Withdrawal Loss, L_{WD} (lb/hr)

VOC Emission (tpy) = [Rim Seal Loss, L_R (lb/yr) + Deck fitting Loss, L_F (lb/yr) + Deck Seam Loss, L_D (lb/yr) + Withdrawal Loss, L_{WD} (lb/yr)] * 1 ton / 2,000 lb

[2] H_2S Emissions (lb/hr) = VOC emissions (lb/hr) * H_2S Emission Factor (lb H_2S / lb VOC)

H_2S Emissions (tpy) = VOC emissions (tpy) * H_2S Emission Factor (lb H_2S / lb VOC)

Table 8

Equipment Leak Fugitive Emissions (EPN FUG)

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC

Currently Permitted Components

Component	Quantity	Stream Type [1]	Emission Factor [2] (lb/component-hr)	LDAR Program [3]	Control Efficiency	Emissions [4] (lb/hour)	Emissions [5] (tpy)	Additional LDAR	Control Efficiency	Emissions [4] (lb/hour)	Emissions [5] (tpy)
Valves	3,097	Light Liquid	0.0055	28VHP	97%	0.51	2.24	None	0%	0.51	2.24
	672	Gas/Vapor	0.00992	28VHP	97%	0.20	0.88	None	0%	0.20	0.88
Pumps	84	Light Liquid	0.02866	28VHP	85%	0.36	1.58	None	0%	0.36	1.58
Flanges	9,291	Light Liquid	0.000243	28VHP	30%	1.58	6.92	28CNTQ	97%	0.07	0.30
	2,016	Gas/Vapor	0.00086	28VHP	30%	1.21	5.32	28CNTQ	97%	0.05	0.23
Compressors	10	Gas/Vapor	0.0194	28VHP	85%	0.03	0.13	None	0%	0.03	0.13
Relief Valves	175	Light Liquid	0.0165	28VHP	97%	0.09	0.38	None	0%	0.09	0.38
	15	Gas/Vapor	0.0194	28VHP	97%	8.73E-03	0.04	None	0%	0.01	0.04
Total Fugitive VOC Losses						3.99	17.48			1.32	5.77
Maximum H_2S factor (lb H_2S/lb VOC, based on 10 ppmw H_2S content)						1.09E-03	1.09E-03			1.09E-03	1.09E-03
Fugitive H_2S Losses [6]						4.33E-03	0.02			1.43E-03	6.26E-03

PBR Components (associated with tanks T-121 through T-125)

Component	Quantity	Stream Type [1]	Emission Factor [2] (lb/component-hr)	LDAR Program [3]	Control Efficiency	Emissions [4] (lb/hour)	Emissions [5] (tpy)	Additional LDAR	Control Efficiency	Emissions [4] (lb/hour)	Emissions [5] (tpy)
Valves	80	Light Liquid	0.0055	28VHP	97%	0.01	0.06	None	0%	0.01	0.06
Flanges	400	Light Liquid	0.000243	28VHP	30%	0.07	0.30	28CNTQ	97%	0.00	0.01
Total Fugitive VOC Losses						0.08	0.36			0.02	0.07
Maximum H_2S factor (lb H_2S/lb VOC, based on 10 ppmw H_2S content)						1.09E-03	1.09E-03			1.09E-03	1.09E-03
Fugitive H_2S Losses [6]						8.82E-05	3.86E-04			1.75E-05	7.67E-05

New Project Components (associated with tanks T-126 through T-144)

Component	Quantity	Stream Type [1]	Emission Factor [2] (lb/component-hr)	LDAR Program [3]	Control Efficiency	Emissions [4] (lb/hour)	Emissions [5] (tpy)
Valves	1,549	Light Liquid	0.0055	28VHP	97%	0.26	1.12
	336	Gas/Vapor	0.00992	28VHP	97%	0.10	0.44
Pumps	42	Light Liquid	0.02866	28VHP	85%	0.18	0.79
Flanges	4,646	Light Liquid	0.000243	28VHP + 28CNTQ	97%	0.03	0.15
	1,008	Gas/Vapor	0.00086	28VHP + 28CNTQ	97%	0.03	0.11
Compressors	5	Gas/Vapor	0.0194	28VHP	85%	0.01	0.06
Relief Valves	88	Light Liquid	0.0165	28VHP	97%	0.04	0.19
	8	Gas/Vapor	0.0194	28VHP	97%	4.66E-03	0.02
Total Fugitive VOC Losses						0.66	2.89
Maximum H_2S factor (lb H_2S/lb VOC, based on 10 ppmw H_2S content)						1.09E-03	1.09E-03
Fugitive H_2S Losses [6]						7.15E-04	3.13E-03

Total Fugitives

EPN: FUG							
Component	**Quantity**	**Stream Type [1]**	**Emission Factor [2] (lb/component-hr)**	**LDAR Program [3]**	**Control Efficiency**	**Emissions [4] (lb/hour)**	**Emissions [5] (tpy)**
Valves	5,237	Light Liquid	0.0055	28VHP	97%	0.86	3.78
	1,008	Gas/Vapor	0.00992	28VHP	97%	0.30	1.31
Pumps	144	Light Liquid	0.02866	28VHP	85%	0.62	2.71
Flanges	15,885	Light Liquid	0.000243	28VHP + 28CNTQ	97%	0.12	0.51
	3,024	Gas/Vapor	0.00086	28VHP + 28CNTQ	97%	0.08	0.34
Compressors	15	Gas/Vapor	0.0194	28VHP	85%	0.04	0.19
Relief Valves	263	Light Liquid	0.0165	28VHP	97%	0.13	0.57
	23	Gas/Vapor	0.0194	28VHP	97%	0.01	0.06
Total Fugitive VOC Losses						2.16	9.48
Maximum H_2S factor (lb H_2S/lb VOC, based on 10 ppmw H_2S content)						1.09E-03	1.09E-03
Fugitive H_2S Losses [6]						2.35E-03	0.01

Notes:

[1] Light liquids are those with a vapor pressure > 0.044 psia at 68°F, according to TCEQ Air Permit Technical Guidance for Chemical Sources: Fugitive Guidance (APDG 6422v2, Jun 2018), pg. 3 of 33.

[2] SOCMI Without Ethylene fugitive emission factors were obtained from Table I from the TCEQ Air Permit Technical Guidance for Chemical Sources: Fugitive Guidance (APDG 6422v2, Jun 2018).

[3] The Ingleside Terminal has uncontrolled fugitive emissions greater than 25 tons per year and according to TCEQ BACT, must use the 28VHP LDAR Program to monitor its equipment leak fugitives. The terminal also uses the 28CNTQ monitoring program on its flanges and connectors.

[4] Emissions are calculated according to the following equation

$$No.of\ components\ \times Emission\ Factor\ (lb/component - hr) \times (1 - Control\ Efficiency)$$

[5] Emissions are calculated according to the following equation

$$Short - term\ Emissions\ (lb/hr) \times Conversion\ (8{,}760\ hr/yr) \div Conversion\ (2{,}000\ lb/ton)$$

[7] H_2S content is based on the maximum vapor content in any product. Emissions are calculated according to the following equation:

$$Emissions\ (lb/hr\ \ or\ \ tons/year) \times H_2S\ Emission\ Factor\ \left(\frac{lb\ H_2S}{lb\ VOC}\ or\ \frac{ton\ H_2S}{ton\ VOC}\right)$$

Table 9

Storage Tank Roof Landing Emissions (EPNs VCU-4 and PORTVC) - Crude Oil

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC

			Product Change Landings					Degassing						
Tank Name:		**Drain-Dry**	**467k BBL Tanks**	**373k BBL Tanks**	**310k BBL Tanks**	**202k BBL Tanks**	**1k BBL Tanks**	**467k BBL Tanks**	**373k BBL Tanks**	**310k BBL Tanks**	**202k BBL Tanks**	**12.6k BBL Tanks**	**1k BBL Tanks**	**Information Source**
Product:			**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	
Diameter	D	ft	210	190	210	140	21.5	210	190	210	140	46.0	21.5	
Landed Roof Height	h_v	ft	3.17	3.17	3.17	3.17	3.17	4.33	4.33	4.33	4.33	4.33	4.33	The roof height for product change landings corresponds to the highest critical zone height of all tanks (3 feet, 2 inches). The roof height for degassing corresponds to the highest roof float height of all tanks (4 feet, 4 inches).
Total Volume under Floating Roof	V_V	ft^3	109,680.85	89,784.10	109,680.85	48,747.05	1,149.66	150,089.59	122,862.45	150,089.59	66,706.48	7,201.58	1,573.22	Equation (1-3, using h_V): $h_V \pi D^2/4$
Hours/Day	n_d	dimensionless	24	24	24	24	24	24	24	24	24	24	24	
Maximum Standing Idle Duration	T_{stand}	hours/event	24	24	24	24	24	24	24	24	24	24	24	
Refilling Rate		bbl/hr	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	
Refilling Duration	T_{fill}	hours/event	3.91	3.20	3.91	1.74	0.04	5.35	4.38	5.35	2.38	0.26	0.06	$T_{fill} = V_V (ft^3) \div$ Conversion $(ft^3/bbl) \div$ Refilling Rate (bbl/hr)
Controlled Roof Landing Episodes/Year/Tank	n_d	dimensionless	2	2	2	2	2	1	1	1	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	6	0	0	4	0	6	0	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	0	1	2	31	2	0	1	2	2	
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-19 (Nov 2006).
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
MW Liquid	M_L	lb/lb-mole	207	207	207	207	207	207	207	207	207	207	207	From EPA TANKS 4.09d.
MW Vapor	M_V	lb/lb-mole	50	50	50	50	50	50	50	50	50	50	50	From EPA TANKS 4.09d.
MW H_2S	-	lb/lb-mole	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	34.08	Liquid and vapor MW of H_2S
Liquid Density	W_L	lb/gal	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	From EPA TANKS 4.09d.
Liquid Mole Fraction H_2S	X_{H2S}	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	X_{H2S} = Liquid H_2S Conc (ppmw) ÷ 1,000,000 parts/million parts × MW Crude Liquid (lb/lb-mole) ÷ MW H_2S (lb/lb-mole)
Liquid Mole Fraction VOC	X_{VOC}	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	Conservatively assumes that the liquid is all VOC.
H_2S K Value	K_{H2S}	-	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	19.628	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	Calculated using Figure 7.1-13b from AP-42 Section 7.1 (Nov 2006). RVP = 9 and Temperature = 70°F.
VOC K Value	K_{VOC}	-	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	$K_{VOC} = P_{VA} \div 14.7$ psia
Vapor Mole Fraction H_2S	Y_{H2S}	-	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	$Y_{H2S} = X_{H2S} \times K_{H2S}$
Vapor Mole Fraction VOC	Y_{VOC}	-	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	0.5945	$Y_{VOC} = X_{VOC} \times K_{VOC}$
Wt. Fraction H_2S in VOC	Z_{H2S}	-	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	$Z_{H2S} = Y_{H2S} \div Y_{VOC} \div$ MW Crude Vapor (lb/lb-mole) × MW H_2S (lb/lb-mole)
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	Z_{H2S} as a percentage
Ideal Gas Constant	R	$(ft^3$-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	529.600	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Clingage Factor	C_S	bbl/1,000 ft^2	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	AP-42 Section 7.1, Table 7.1-10 (Nov 2006), factor for crude oil, gunite lining shell condition.
Controlled Standing Idle Losses (EPNs VCU-4 and PORTVC)														
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	64.96	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1, Eqn. (2-20) (Nov 2006): $L_{SL} = 0.042*C_S*W_L*(\pi*D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	$L_{SL,max}$	lbs	5,059.60	4,141.76	5,059.60	2,248.71	53.03	6,923.66	5,667.67	6,923.66	3,077.18	332.21	72.57	AP-42 Section 7.1, Eqn. (2-23) (Nov 2006): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	5,059.60	4,141.76	5,059.60	2,248.71	53.03	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1, Eqn. (2-24) (Nov 2006): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Controlled VOC Standing Idle Losses/Tank	L_{SL}	lbs	5.06	4.14	5.06	2.25	0.05	6.20	5.07	6.20	2.75	0.30	0.06	Total Uncontrolled VOC Standing Idle Losses (lbs) × (1 - 99% DRE)
Total Controlled H_2S Standing Idle Losses/Tank	L_{SL}	lbs	6.92E-03	5.66E-03	6.92E-03	3.07E-03	7.25E-05	8.47E-03	6.93E-03	8.47E-03	3.76E-03	4.06E-04	8.88E-05	Total Uncontrolled VOC Standing Idle Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Standing Idle Losses/Tank	L_{SL}	lbs	12.99	10.63	12.99	5.77	0.14	15.91	13.02	15.91	7.07	0.76	0.17	Assumes that unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Standing Idle Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**0.84**	**0.69**	**0.84**	**0.37**	**8.84E-03**	**0.52**	**0.42**	**0.52**	**0.23**	**0.02**	**5.41E-03**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly Controlled H_2S Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**1.15E-03**	**9.44E-04**	**1.15E-03**	**5.12E-04**	**1.21E-05**	**7.06E-04**	**5.78E-04**	**7.06E-04**	**3.14E-04**	**3.39E-05**	**7.40E-06**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly SO_2 Emissions from Control of Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**2.16**	**1.77**	**2.16**	**0.96**	**0.02**	**1.33**	**1.09**	**1.33**	**0.59**	**0.06**	**0.01**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.

Table 9
Storage Tank Roof Landing Emissions (EPNs VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

			Product Change Landings					Degassing						
Tank Name:		**Drain-Dry**	**467k BBL Tanks**	**373k BBL Tanks**	**310k BBL Tanks**	**202k BBL Tanks**	**1k BBL Tanks**	**467k BBL Tanks**	**373k BBL Tanks**	**310k BBL Tanks**	**202k BBL Tanks**	**12.6k BBL Tanks**	**1k BBL Tanks**	**Information Source**
Product:			**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	**Crude Oil**	
Controlled Filling Losses (EPNs VCU-4 and PORTVC)														
Total Uncontrolled VOC Filling Losses/Tank	L_{FL}	lbs	1,264.90	1,035.44	1,264.90	562.18	13.26	1,730.91	1,416.92	1,730.91	769.30	83.05	18.14	AP-42 Section 7.1, Eqn. (2-26) (Nov 2006): $L_{FL} = [(P_{VA}V_V)/(RT_{LA})]*M_V*S$ / Episode
Total Controlled VOC Filling Losses/Tank	L_{FL}	lbs	1.26	1.04	1.26	0.56	0.01	1.73	1.42	1.73	0.77	0.08	0.02	Total Uncontrolled VOC Filling Losses (lbs) × (1 - 99% DRE)
Total Controlled H_2S Filling Losses/Tank	L_{FL}	lbs	1.73E-03	1.42E-03	1.73E-03	7.68E-04	1.81E-05	2.37E-03	1.94E-03	2.37E-03	1.05E-03	1.14E-04	2.48E-05	Total Uncontrolled VOC Filling Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Filling Losses/Tank	L_{FL}	lbs	3.25	2.66	3.25	1.44	0.03	4.44	3.64	4.44	1.97	0.21	0.05	Assumes that all unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Filling Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**0.32**	**0.32**	**0.32**	**0.32**	**0.01**	**0.32**	**0.32**	**0.32**	**0.32**	**0.08**	**0.02**	Total Controlled VOC Filling Losses (lbs) ÷ Refill Duration (hours) If the Refill Duration is < 1 hour, then the Total Controlled VOC Filling Losses all occur in the worst-case hour.
Max. Hourly Controlled H_2S Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**1.81E-05**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**4.42E-04**	**1.14E-04**	**2.48E-05**	Total Controlled VOC Filling Losses (lbs/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Control of Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	Total SO_2 from Controlled Filling Losses/Tank (lbs) ÷ Refill Duration (hours)
Total Controlled Losses (EPNs VCU-4 and PORTVC)														
Total Controlled VOC Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	6.32	5.18	6.32	2.81	0.07	7.93	6.49	7.93	3.52	0.38	0.08	Total Controlled VOC Standing Idle Losses/Tank (lbs) + Total Controlled VOC Filling Losses/Tank (lbs)
Total Controlled H_2S Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	8.65E-03	7.08E-03	8.65E-03	3.84E-03	9.06E-05	0.01	8.87E-03	0.01	4.82E-03	5.20E-04	1.14E-04	Total Controlled H_2S Standing Idle Losses/Tank (lbs) + Total Controlled H_2S Filling Losses/Tank (lbs)
Total Controlled SO_2 Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	16.23	13.29	16.23	7.22	0.17	20.35	16.66	20.35	9.04	0.98	0.21	Total SO_2 from Controlled Standing Idle Losses/Tank (lbs) + Total SO_2 from Controlled Filling Losses/Tank (lbs)
Total Annual Controlled VOC Losses (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**0.03**	--	**0.04**	--	--	**0.02**	--	**0.02**	--	--	--	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**3.46E-05**	--	**5.19E-05**	--	--	**2.17E-05**	--	**3.25E-05**	--	--	--	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**0.06**	--	**0.10**	--	--	**0.04**	--	**0.06**	--	--	--	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled VOC Losses (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**0.20**	**0.01**	--	**2.81E-03**	**1.33E-04**	**0.12**	**6.49E-03**	--	**1.76E-03**	**3.80E-04**	**8.31E-05**	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**2.68E-04**	**1.42E-05**	--	**3.84E-06**	**1.81E-07**	**1.68E-04**	**8.87E-06**	--	**2.41E-06**	**5.20E-07**	**1.14E-07**	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**0.50**	**0.03**	--	**7.22E-03**	**3.40E-04**	**0.32**	**0.02**	--	**4.52E-03**	**9.76E-04**	**2.13E-04**	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61 ft^3/bbl
1,000,000 parts/million parts
34.08 MW H_2S, lb/lb-mole
64 MW SO_2, lb/lb-mole
2,000 lb/ton

Table 10
Storage Tank Roof Landing Emissions (EPNs VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

			Product Change Landings			Degassing			
Tank Name:		**Drain-Dry**	**467k BBL Tanks**	**373k BBL Tanks**	**202k BBL Tanks**	**467k BBL Tanks**	**373k BBL Tanks**	**202k BBL Tanks**	**Information Source**
Product:			**Condensate**	**Condensate**	**Condensate**	**Condensate**	**Condensate**	**Condensate**	
Diameter	D	ft	210	190	140	210	190	140	
Landed Roof Height	h_v	ft	3.17	3.17	3.17	4.33	4.33	4.33	The roof height for product change landings corresponds to the highest critical zone height of all tanks (3 feet, 2 inches). The roof height for degassing corresponds to the highest roof float height of all tanks (4 feet, 4 inches).
Total Volume under Floating Roof	V_V	ft^3	109,680.85	89,784.10	48,747.05	150,089.59	122,862.45	66,706.48	Equation (1-3, using h_v): $h_V \pi D^2/4$
Hours/Day	n_d	dimensionless	24	24	24	24	24	24	
Maximum Standing Idle Duration	T_{stand}	hours/event	24	24	24	24	24	24	
Refilling Rate		bbl/hr	5,000	5,000	5,000	5,000	5,000	5,000	
Refilling Duration	T_{fill}	hours/event	3.91	3.20	1.74	5.35	4.38	2.38	$T_{fill} = V_V (ft^3) \div$ Conversion (ft^3/bbl) $\div$ Refilling Rate (bbl/hr)
Controlled Roof Landing Episodes/Year/Tank	n_d	dimensionless	2	2	2	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	0	4	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks. The other tanks do not store condensate.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	1	31	2	1	
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-19 (Nov 2006).
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
MW Liquid	M_L	lb/lb-mole	92	92	92	92	92	92	From EPA TANKS 4.09d, value for gasoline (RVP 11).
MW Vapor	M_V	lb/lb-mole	65	65	65	65	65	65	From EPA TANKS 4.09d, value for gasoline (RVP 11).
MW H_2S	-	lb/lb-mole	34.08	34.08	34.08	34.08	34.08	34.08	Liquid and vapor MW of H_2S
Liquid Density	W_L	lb/gal	5.60	5.60	5.60	5.60	5.60	5.60	From EPA TANKS 4.09d, value for gasoline (RVP 11).
Liquid Mole Fraction H_2S	X_{H2S}	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	X_{H2S} = Liquid H_2S Conc (ppmw) ÷ 1,000,000 parts/million parts × MW Condensate Liquid (lb/lb-mole) ÷ MW H_2S (lb/lb-mole)
Liquid Mole Fraction VOC	X_{VOC}	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	Conservatively assumes that the liquid is all VOC.
H_2S K Value	K_{H2S}	-	19.628	19.628	19.628	19.628	19.628	19.628	Obtained from flash emission data using EPCON International's THERMA Flash/Mixture Calculations Software which is based on API's Technical Data Book (8th Edition).
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.70	8.70	8.70	8.70	8.70	8.70	Calculated using Figure 7.1-14b from AP-42 Section 7.1 (Nov 2006). RVP = 11 and Temperature = 70°F.
VOC K Value	K_{VOC}	-	0.5916	0.5916	0.5916	0.5916	0.5916	0.5916	$K_{VOC} = P_{VA} \div 14.7$ psia
Vapor Mole Fraction H_2S	Y_{H2S}	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	$Y_{H2S} = X_{H2S} \times K_{H2S}$
Vapor Mole Fraction VOC	Y_{VOC}	-	0.5916	0.5916	0.5916	0.5916	0.5916	0.5916	$Y_{VOC} = X_{VOC} \times K_{VOC}$
Wt. Fraction H_2S in VOC	Z_{H2S}	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	$Z_{H2S} = Y_{H2S} \div Y_{VOC}$ ÷ MW Condensate Vapor (lb/lb-mole) × MW H_2S (lb/lb-mole)
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	Z_{H2S} as a percentage
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.600	529.600	529.600	529.600	529.600	529.600	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Clingage Factor	C_S	bbl/1,000 ft^2	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-10 (Nov 2006), factor for gasoline, gunite lining shell condition.
Controlled Standing Idle Losses (EPNs VCU-4 and PORTVC)									
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	1,221.96	1,000.29	543.09	AP-42 Section 7.1, Eqn. (2-20) (Nov 2006): $L_{SL} = 0.042{*}C_S{*}W_L{*}(\pi{*}D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	$L_{SL,max}$	lbs	6,545.78	5,358.34	2,909.24	8,957.38	7,332.46	3,981.06	AP-42 Section 7.1, Eqn. (2-23) (Nov 2006): $L_{SL,max} = 0.60{*}[(P_{VA}V_V)/(RT)]{*}M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	1,221.96	1,000.29	543.09	AP-42 Section 7.1, Eqn. (2-24) (Nov 2006): $L_{SL} \leq 0.60{*}[(P_{VA}V_V)/(RT)]{*}M_V$ / Episode
Total Controlled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1.22	1.00	0.54	1.22	1.00	0.54	Total Uncontrolled VOC Standing Idle Losses (lbs) × (1 - 99% DRE)
Total Controlled H_2S Standing Idle Losses/Tank	L_{SL}	lbs	5.74E-04	4.70E-04	2.55E-04	5.74E-04	4.70E-04	2.55E-04	Total Uncontrolled VOC Standing Idle Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Standing Idle Losses/Tank	L_{SL}	lbs	1.08	0.88	0.48	1.08	0.88	0.48	Assumes that unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Standing Idle Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**0.20**	**0.17**	**0.09**	**0.10**	**0.08**	**0.05**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly Controlled H_2S Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{SL}**	**lbs/hr**	**9.56E-05**	**7.83E-05**	**4.25E-05**	**4.78E-05**	**3.91E-05**	**2.13E-05**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.
Max. Hourly SO_2 Emissions from Control of Standing Idle Losses/Tank (EPNs VCU-4 and PORTVC)	**L_{FL}**	**lbs/hr**	**0.18**	**0.15**	**0.08**	**0.09**	**0.07**	**0.04**	Product Change Landings: Assumed that the roof would be landed for 6 hours to conservatively estimate hourly emissions. Degassing: Assumed that the roof would be landed at least half of one day to conservatively estimate hourly emissions.

Table 10
Storage Tank Roof Landing Emissions (EPNs VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

			Product Change Landings			Degassing			
Tank Name:		**Drain-Dry**	**467k BBL Tanks**	**373k BBL Tanks**	**202k BBL Tanks**	**467k BBL Tanks**	**373k BBL Tanks**	**202k BBL Tanks**	**Information Source**
Product:			**Condensate**	**Condensate**	**Condensate**	**Condensate**	**Condensate**	**Condensate**	
Controlled Filling Losses (EPNs VCU-4 and PORTVC)									
Total Uncontrolled VOC Filling Losses/Tank	L_{FL}	lbs	1,636.44	1,339.58	727.31	2,239.35	1,833.12	995.26	AP-42 Section 7.1, Eqn. (2-26) (Nov 2006): $L_{FL} = [(P_{VA}V_V)/(RT_{LA})]*M_V*S$ / Episode
Total Controlled VOC Filling Losses/Tank	L_{FL}	lbs	1.64	1.34	0.73	2.24	1.83	1.00	Total Uncontrolled VOC Filling Losses (lbs) × (1 - 99% DRE)
Total Controlled H_2S Filling Losses/Tank	L_{FL}	lbs	7.68E-04	6.29E-04	3.42E-04	1.05E-03	8.61E-04	4.67E-04	Total Uncontrolled VOC Filling Losses × % H_2S in Vapors × (1 - DRE %)
Total SO_2 from Controlled Filling Losses/Tank	L_{FL}	lbs	1.44	1.18	0.64	1.97	1.62	0.88	Assumes that all unscrubbed H_2S is converted to SO_2. Uncontrolled VOC Filling Losses (lbs) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Max. Hourly Controlled VOC Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**0.42**	**0.42**	**0.42**	**0.42**	**0.42**	**0.42**	Total Controlled VOC Filling Losses (lbs) ÷ Refill Duration (hours) If the Refill Duration is < 1 hour, then the Total Controlled VOC Filling Losses all occur in the worst-case hour.
Max. Hourly Controlled H_2S Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	**1.97E-04**	Total Controlled VOC Filling Losses (lbs/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Control of Filling Losses/Tank (EPNs VCU-4 and PORTVC)	L_{FL}	**lbs/hr**	**0.37**	**0.37**	**0.37**	**0.37**	**0.37**	**0.37**	Total SO_2 from Controlled Filling Losses/Tank (lbs) ÷ Refill Duration (hours)
Total Controlled Losses (EPNs VCU-4 and PORTVC)									
Total Controlled VOC Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	2.86	2.34	1.27	3.46	2.83	1.54	Total Controlled VOC Standing Idle Losses/Tank (lbs) + Total Controlled VOC Filling Losses/Tank (lbs)
Total Controlled H_2S Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	1.34E-03	1.10E-03	5.97E-04	1.63E-03	1.33E-03	7.22E-04	Total Controlled H_2S Standing Idle Losses/Tank (lbs) + Total Controlled H_2S Filling Losses/Tank (lbs)
Total Controlled SO_2 Emissions/Tank/Episode	$L_{SL}+L_{FL}$	lbs	2.52	2.06	1.12	3.05	2.50	1.36	Total SO_2 from Controlled Standing Idle Losses/Tank (lbs) + Total SO_2 from Controlled Filling Losses/Tank (lbs)
Total Annual Controlled VOC Losses (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**0.01**	--	--	**6.92E-03**	--	--	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**5.37E-06**	--	--	**3.25E-06**	--	--	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN VCU-4)	$L_{SL}+L_{FL}$	**tpy**	**0.01**	--	--	**6.10E-03**	--	--	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled VOC Losses (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**0.09**	**4.68E-03**	**1.27E-03**	**0.05**	**2.83E-03**	**7.69E-04**	Total Controlled VOC Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual Controlled H_2S Losses (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**4.16E-05**	**2.20E-06**	**5.97E-07**	**2.52E-05**	**1.33E-06**	**3.61E-07**	Total Controlled H_2S Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Annual SO_2 Emissions from Control of Roof Landings (EPN PORTVC)	$L_{SL}+L_{FL}$	**tpy**	**0.08**	**4.13E-03**	**1.12E-03**	**0.05**	**2.50E-03**	**6.78E-04**	Total Controlled SO_2 Emissions/Tank/Episode (lbs) × Controlled Roof Landing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton

Table 11
Storage Tank Degassing Emissions (EPNs VCU-4, PORTVC, and MSS-ATM) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Tank Name:		Drain-Dry	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	Information Source
Product:			Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Diameter	D	ft	210	190	210	140	46.0	21.5	
Deck Height on Legs for Controlled Degassing and Uncontrolled Venting	h_V	ft	4.33	4.33	4.33	4.33	4.33	4.33	
VCU Maximum Volumetric Flow	V_{VP}	ft^3/hour	39,302	39,302	39,302	39,302	39,302	39,302	Used as the flow rate for controlled emissions from EPN: VCU-4.
Uncontrolled Venting Maximum Volumetric Flow	V_{VP}	ft^3/hour	200,000	200,000	200,000	200,000	200,000	200,000	Used as the flow rate for uncontrolled emissions from EPN: MSS-ATM.
Total Volume under Floating Roof	V_V	ft^3	150,090	122,862	150,090	66,706	7,202	1,573	Equation (1-3, using h_V): $h_V \pi D^2/4$
Controlled Degassing Episodes/Year/Tank	n_d	dimensionless	1	1	1	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	6	0	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	0	1	2	2	
Turnovers per Tank per Event	-	dimensionless	4	4	4	4	4	4	
Duration per Controlled Degassing Event	T_{degas}	hrs/event	15.3	12.5	15.3	6.8	0.7	0.2	T_{degas} = V_V (ft^3) × Turnovers/tank-event ÷ VCU Maximum Volumetric Flow (ft^3/hour)
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-19 (Nov 2006).
MW Vapor	M_V	lb/lb-mole	50	50	50	50	50	50	From EPA TANKS 4.09d.
Liquid Density	W_L	lb/gal	7.10	7.10	7.10	7.10	7.10	7.10	From EPA TANKS 4.09d.
Liquid H_2S Concentration	-	ppmw	10	10	10	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
% H_2S in Liquid	-	%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.14%	0.14%	0.14%	0.14%	0.14%	0.14%	See Table 9 for calculation.
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.74	8.74	8.74	8.74	8.74	8.74	Calculated using Figure 7.1-13b from AP-42 Section 7.1 (Nov 2006). RVP = 9 and Temperature = 70°F.
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.6	529.6	529.6	529.6	529.6	529.6	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Tank Degassing VOC Concentration Level	-	ppmv	10,000	10,000	10,000	10,000	10,000	10,000	10,000 ppmv is the degassing limit according to TCEQ BACT for Storage Tank MSS
Total Uncontrolled VOC Venting Losses / Tank / Episode	$L_{degas,VOC}$	lbs	198.01	162.09	198.01	88.00	9.50	2.08	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × Total Volume Under Floating Roof (ft^3) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole)
Total Uncontrolled H_2S Venting Emissions / Tank / Episode	$L_{degas,H2S}$	lbs	0.27	0.22	0.27	0.12	0.01	2.84E-03	Quantity of H_2S remaining in tank at the maximum Tank Degassing VOC Concentration Level. Total Uncontrolled VOC Venting Losses / Episode ($L_{degas,VOC}$) × % H_2S in Vapors
Clingage Factor	C_S	bbl/1,000 ft^2	0.60	0.60	0.60	0.60	0.60	0.60	AP-42 Section 7.1, Table 7.1-10 (Nov 2006), factor for crude oil, gunite lining shell condition.
Total Controlled Degassing Losses (EPNs VCU-4 and PORTVC)									
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1, Eqn. (2-20) (Nov 2006): $L_{SL} = 0.042*C_S*W_L*(\pi*D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	L_{SL}	lbs	6,923.66	5,667.67	6,923.66	3,077.18	332.21	72.57	AP-42 Section 7.1, Eqn. (2-23) (Nov 2006): $L_{SL,max} = 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	6,197.08	5,072.90	6,197.08	2,754.26	297.35	64.96	AP-42 Section 7.1, Eqn. (2-24) (Nov 2006): $L_{SL} \leq 0.60*[(P_{VA}V_V)/(RT)]*M_V$ / Episode
Max. Hourly Controlled VOC Degassing Losses Prior to Venting (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**1.57**	**1.57**	**1.57**	**1.57**	**0.29**	**0.06**	(Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses/Tank (lbs)) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × (1 - 99.5% DRE) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Max. Hourly Controlled H_2S Degassing Losses Prior to Venting (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**2.15E-03**	**2.15E-03**	**2.15E-03**	**2.15E-03**	**3.93E-04**	**8.60E-05**	Max. Hourly Controlled VOC Degassing Losses Prior to Venting (lb/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Combustion of Degassing Losses (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**0.03**	**0.03**	**0.03**	**0.03**	**5.58E-03**	**1.22E-03**	Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Total Controlled Degassing VOC Emissions / Tank / Episode	L_{degas}	lbs	6.00	4.91	6.00	2.67	0.29	0.06	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × (1 - 99.5% DRE)
Total Controlled Degassing H_2S Emissions / Tank / Episode	L_{degas}	lbs	8.20E-03	6.71E-03	8.20E-03	3.64E-03	3.93E-04	8.60E-05	Total Controlled Degassing VOC Emissions / Episode (lbs) × % H_2S in Vapors
Total Degassing SO_2 Emissions / Tank / Episode	L_{degas}	lbs	15.40	12.61	15.40	6.84	0.74	0.16	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)

Table 11
Storage Tank Degassing Emissions (EPNs VCU-4, PORTVC, and MSS-ATM) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Tank Name:		Drain-Dry	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	Information Source
Product:			Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil	
Total Controlled Degassing VOC Emissions / Year (EPN VCU-4)	L_{degas}	tpy	0.01	--	0.02	--	--	--	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN VCU-4)	L_{degas}	tpy	1.64E-05	--	2.46E-05	--	--	--	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN VCU-4)	L_{degas}	tpy	0.03	--	0.05	--	--	--	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing VOC Emissions / Year (EPN PORTVC)	L_{degas}	tpy	0.09	4.91E-03	--	1.33E-03	2.88E-04	6.29E-05	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN PORTVC)	L_{degas}	tpy	1.27E-04	6.71E-06	--	1.82E-06	3.93E-07	8.60E-08	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN PORTVC)	L_{degas}	tpy	0.24	0.01	--	3.42E-03	7.39E-04	1.61E-04	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Uncontrolled Atmospheric Degassing Emissions (EPN MSS-ATM)									
Max. Hourly Uncontrolled VOC Venting Losses (EPN MSS-ATM)	L_{degas}	lbs/hr	198.01	162.09	198.01	88.00	9.50	2.08	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × V_V (ft^3) or V_{VP} (ft^3/hour) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole) *If the volume under the landed roof (V_V) is greater than or equal to the maximum uncontrolled volumetric flow rate, use the maximum uncontrolled volumetric flow rate. If the volume under the landed roof (V_V) is less than the maximum uncontrolled volumetric flow rate, then the uncontrolled degassing emissions are all emitted in the worst-case hour.
Max. Hourly Uncontrolled H_2S Venting Losses (EPN MSS-ATM)	L_{degas}	lbs/hr	0.27	0.22	0.27	0.12	0.01	2.84E-03	Max. Hourly Uncontrolled VOC Venting Losses (lb/hr) × % H_2S in Vapors
Total Annual Uncontrolled VOC Venting Losses (EPN MSS-ATM)	L_{degas}	tpy	3.47	0.16	0.59	0.04	9.50E-03	2.08E-03	Total Uncontrolled VOC Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Annual emissions are for the group of tanks, not per tank.
Total Annual Uncontrolled H_2S Venting Losses (EPN MSS-ATM)	L_{degas}	tpy	4.74E-03	2.22E-04	8.12E-04	6.01E-05	1.30E-05	2.84E-06	Total Uncontrolled H_2S Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton
379	scf/lb-mole at 60°F and 1 atm

Table 12
Storage Tank Degassing Emissions (EPNs VCU-4, PORTVC, and MSS-ATM) - Condensate
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Tank Name:		Drain-Dry	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	Information Source
Product:			Condensate	Condensate	Condensate	
Diameter	D	ft	210	190	140	
Deck Height on Legs for Controlled Degassing and Uncontrolled Venting	h_V	ft	4.33	4.33	4.33	
VCU Maximum Volumetric Flow	V_{VP}	ft^3/hour	39,302	39,302	39,302	Used as the flow rate for controlled emissions from EPN: VCU-4.
Uncontrolled Venting Maximum Volumetric Flow	V_{VP}	ft^3/hour	200,000	200,000	200,000	Used as the flow rate for uncontrolled emissions from EPN: MSS-ATM.
Total Volume under Floating Roof	V_V	ft^3	150,090	122,862	66,706	Equation (1-3, using h_V): $h_V \pi D^2/4$
Controlled Degassing Episodes/Year/Tank	n_d	dimensionless	1	1	1	
Number of Tanks Controlled by VCU-4	-	dimensionless	4	0	0	The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks. The other tanks do not store condensate.
Number of Tanks Controlled by PORTVC	-	dimensionless	31	2	1	
Turnovers per Tank per Event	-	dimensionless	4	4	4	
Duration per Controlled Degassing Event	T_{degas}	hrs/event	15.3	12.5	6.8	$T_{degas} = V_V$ (ft^3) × Turnovers/tank-event ÷ VCU Maximum Volumetric Flow (ft^3/hour)
Filling Saturation Factor	S	dimensionless	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-19 (Nov 2006).
MW Vapor	M_V	lb/lb-mole	65	65	65	From EPA TANKS 4.09d, value for gasoline (RVP 11).
Liquid Density	W_L	lb/gal	5.60	5.60	5.60	From EPA TANKS 4.09d, value for gasoline (RVP 11).
Liquid H_2S Concentration	-	ppmw	10	10	10	Maximum allowable H_2S concentration for controlled roof landing events.
% H_2S in Liquid	-	%	0.00%	0.00%	0.00%	Liquid H_2S Concentration (ppmw) ÷ 1,000,000 parts/million parts
% H_2S in Vapors	-	% @ T_{LA}	0.05%	0.05%	0.05%	See Table 10 for calculation.
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ T_{LA}	8.70	8.70	8.70	Calculated using Figure 7.1-14b from AP-42 Section 7.1 (Nov 2006). RVP = 9 and Temperature = 70°F.
Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-°R)	10.731	10.731	10.731	
Average Temperature	T_{LA}	°R	529.6	529.6	529.6	Average temperature = 70°F; °R = °F + 459.6
VCU Destruction Rate Efficiency (VCU-4 and PORTVC)	DRE	dimensionless	99.9%	99.9%	99.9%	
Tank Degassing VOC Concentration Level	-	ppmv	10,000	10,000	10,000	10,000 ppmv is the degassing limit according to TCEQ BACT for Storage Tank MSS
Total Uncontrolled VOC Venting Losses / Tank / Episode	L_{degas}	lbs	257.41	210.71	114.40	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × Total Volume Under Floating Roof (ft^3) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole)
Total Uncontrolled H_2S Venting Emissions / Tank / Episode	L_{degas}	lbs	0.12	0.10	0.05	Quantity of H_2S remaining in tank at the maximum Tank Degassing VOC Concentration Level. Total Uncontrolled VOC Venting Losses / Episode ($L_{degas,VOC}$) × % H_2S in Vapors
Clingage Factor	C_S	bbl/1,000 ft^2	0.15	0.15	0.15	AP-42 Section 7.1, Table 7.1-10 (Nov 2006), factor for gasoline, gunite lining shell condition.
Total Controlled Degassing Losses (EPNs VCU-4 and PORTVC)						
Standing Loss During Roof Landing/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	AP-42 Section 7.1, Eqn. (2-20) (Nov 2006): $L_{SL} = 0.042{*}C_S{*}W_L{*}(\pi{*}D^2/4)$ / Episode
Maximum Standing Idle Loss for Drain-Dry Tanks Due to Clingage/Tank	L_{SL}	lbs	8,957.38	7,332.46	3,981.06	AP-42 Section 7.1, Eqn. (2-23) (Nov 2006): $L_{SL,max} = 0.60{*}[(P_{VA}V_V)/(RT)]{*}M_V$ / Episode
Total Uncontrolled VOC Standing Idle Losses/Tank	L_{SL}	lbs	1,221.96	1,000.29	543.09	AP-42 Section 7.1, Eqn. (2-24) (Nov 2006): $L_{SL} \leq 0.60{*}[(P_{VA}V_V)/(RT)]{*}M_V$ / Episode
Max. Hourly Controlled VOC Degassing Losses Prior to Venting (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**0.25**	**0.25**	**0.25**	(Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses/Tank (lbs)) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × (1 - 99.5% DRE) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.
Max. Hourly Controlled H_2S Degassing Losses Prior to Venting (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**1.19E-04**	**1.19E-04**	**1.19E-04**	Max. Hourly Controlled VOC Degassing Losses Prior to Venting (lb/hr) × % H_2S in Vapors
Max. Hourly SO_2 Emissions from Combustion of Degassing Losses (EPNs VCU-4 and PORTVC)	**L_{degas}**	**lbs/hr**	**6.01E-03**	**6.01E-03**	**6.01E-03**	Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) × V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole) *If the volume under the landed roof (V_V) is less than the maximum volumetric flow to the VCU, more VOC than is produced by standing losses cannot be sent to the control device and V_V (ft^3) ÷ VCU Maximum Volumetric Flow (ft^3/hour) = 1.

Table 12
Storage Tank Degassing Emissions (EPNs VCU-4, PORTVC, and MSS-ATM) - Condensate
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Tank Name:		Drain-Dry	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	Information Source
Product:			Condensate	Condensate	Condensate	
Total Controlled Degassing VOC Emissions / Tank / Episode	L_{degas}	lbs	0.96	0.79	0.43	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × (1 - 99.5% DRE)
Total Controlled Degassing H_2S Emissions / Tank / Episode	L_{degas}	lbs	4.53E-04	3.71E-04	2.01E-04	Total Controlled Degassing VOC Emissions / Episode (lbs) × % H_2S in Vapors
Total Degassing SO_2 Emissions / Tank / Episode	L_{degas}	lbs	0.85	0.70	0.38	[Total Uncontrolled VOC Standing Idle Losses/Tank (lbs) - Total Uncontrolled VOC Venting Losses / Episode (lbs)] × % H_2S in Vapors ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
Total Controlled Degassing VOC Emissions / Year (EPN VCU-4)	L_{degas}	**tpy**	**1.93E-03**	--	--	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN VCU-4)	L_{degas}	**tpy**	**9.06E-07**	--	--	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN VCU-4)	L_{degas}	**tpy**	**1.70E-03**	--	--	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by VCU-4 Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing VOC Emissions / Year (EPN PORTVC)	L_{degas}	**tpy**	**0.01**	**7.90E-04**	**2.14E-04**	Total Controlled Degassing VOC Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Controlled Degassing H_2S Emissions / Year (EPN PORTVC)	L_{degas}	**tpy**	**7.02E-06**	**3.71E-07**	**1.01E-07**	Total Controlled Degassing H_2S Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Total Degassing SO_2 Emissions / Year (EPN PORTVC)	L_{degas}	**tpy**	**0.01**	**6.96E-04**	**1.89E-04**	Total Degassing SO_2 Emissions/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Controlled by PORTVC Annual emissions are for the group of tanks, not per tank.
Uncontrolled Atmospheric Degassing Emissions (EPN MSS-ATM)						
Max. Hourly Uncontrolled VOC Venting Losses (EPN MSS-ATM)	L_{degas}	**lbs/hr**	**257.41**	**210.71**	**114.40**	Quantity of VOCs remaining in tank at the maximum Tank Degassing VOC Concentration Level. $L_{degas,VOC}$ = Tank Degassing VOC Concentration Level (ppmv) ÷ 1,000,000 parts/million parts × V_V (ft^3) or V_{VP} (ft^3/hour) ÷ 379 ft^3/lb-mole × MW Vapor (lb/lb-mole) *If the volume under the landed roof (V_V) is greater than or equal to the maximum uncontrolled volumetric flow rate, use the maximum uncontrolled volumetric flow rate. If the volume under the landed roof (V_V) is less than the maximum uncontrolled volumetric flow rate, then the uncontrolled degassing emissions are all emitted in the worst-case hour.
Max. Hourly Uncontrolled H_2S Venting Losses (EPN MSS-ATM)	L_{degas}	**lbs/hr**	**0.12**	**0.10**	**0.05**	Max. Hourly Uncontrolled VOC Venting Losses (lb/hr) × % H_2S in Vapors
Total Annual Uncontrolled VOC Venting Losses (EPN MSS-ATM)	L_{degas}	**tpy**	**4.50**	**0.21**	**0.06**	Total Uncontrolled VOC Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Annual emissions are for the group of tanks, not per tank.
Total Annual Uncontrolled H_2S Venting Losses (EPN MSS-ATM)	L_{degas}	**tpy**	**2.12E-03**	**9.89E-05**	**2.69E-05**	Total Uncontrolled H_2S Venting Losses/Tank/Episode (lbs) × Controlled Degassing Episodes/Year/Tank ÷ Conversion (2,000 lb/ton) × Number of Tanks Annual emissions are for the group of tanks, not per tank.

Conversions:

5.61	ft^3/bbl
1,000,000	parts/million parts
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole
2,000	lb/ton
379	scf/lb-mole at 60°F and 1 atm

Table 13
MSS Summary - <u>VOC Emissions</u> (EPNs VCU-4, PORTVC, and MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks

		Maximum Short-term Emissions (lb/hr)									Maximum Short-term Emissions [1] (lb/hr)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
Roof Landings (at 3'2")											
Standing	VCU-4	0.84	0.20			0.84					0.84
Refilling	VCU-4	0.32	0.42			0.32					0.42
Standing	PORTVC	0.84	0.20	0.69	0.17		0.37	0.09	--	8.84E-03	0.84
Refilling	PORTVC	0.32	0.42	0.32	0.42		0.32	0.42	--	0.01	0.42
Roof Landing (at 4'4")											
Refilling	VCU-4	0.32	0.42			0.32					0.42
Controlled Degassing	VCU-4	1.57	0.25			1.57					1.57
Roof Landing (at 4'4")											
Refilling	PORTVC	0.32	0.42	0.32	0.42		0.32	0.42	0.08	0.02	0.42
Controlled Degassing	PORTVC	1.57	0.25	1.57	0.25		1.57	0.25	0.29	0.06	1.57
Uncontrolled Venting	MSS-ATM	198.01	257.41	162.09	210.71	198.01	88.00	114.40	9.50	2.08	257.41

		Annual Emissions (tpy)									Annual Storage Tank Emissions [2] (tpy)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
VCU-4											
Roof Landings (at 3'2")	VCU-4	0.03	0.01	--	--	0.04	--	--	--	--	0.06
Roof Landing (at 4'4")	VCU-4	0.02	6.92E-03	--	--	0.02	--	--	--	--	0.04
Controlled Degassing	VCU-4	0.01	1.93E-03	--	--	0.02	--	--	--	--	0.03
PORTVC											
Roof Landings (at 3'2")	PORTVC	0.20	0.09	0.01	4.68E-03	--	2.81E-03	1.27E-03	--	1.33E-04	0.21
Roof Landing (at 4'4")	PORTVC	0.12	0.05	6.49E-03	2.83E-03	--	1.76E-03	7.69E-04	3.80E-04	8.31E-05	0.13
Controlled Degassing	PORTVC	0.09	0.01	4.91E-03	7.90E-04	--	1.33E-03	2.14E-04	2.88E-04	6.29E-05	0.10
MSS-ATM											
Uncontrolled Venting	MSS-ATM	3.47	4.50	0.16	0.21	0.59	0.04	0.06	9.50E-03	2.08E-03	5.38

<u>Worst-Case Annual Emissions Determination</u>

		Annual Emissions (tpy)					
Activity	EPN	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
VCU-4							
Product Change Landings [3]	VCU-4	0.03	--	0.04	--	--	--
Controlled Degassing [4]	VCU-4	0.03	--	0.04	--	--	--
PORTVC							
Product Change Landings [3]	PORTVC	0.20	0.01	--	2.81E-03	--	1.33E-04
Controlled Degassing [4]	PORTVC	0.22	0.01	--	3.09E-03	6.68E-04	1.46E-04
MSS-ATM							
Uncontrolled Venting [5]	MSS-ATM	4.50	0.21	0.59	0.06	9.50E-03	2.08E-03
Maximum [6]	**MSS Limit**	**4.97**	**0.23**	**0.67**	**0.06**	**0.01**	**2.35E-03**

<u>Emissions Summary</u>

EPN	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
VCU-4 [7]	1.57	0.13
PORTVC [7]	1.57	0.44
MSS-ATM	257.41	5.38
MSS Limit [8]	**257.41**	**5.95**

Notes:
[1] Maximum short-term emissions (lb/hr) are the maximum emissions of all products in each tank size, per activity. Only one activity will occur in the worst-case hour.
[2] Annual emissions (tpy) are the sum of the maximum emissions per product, per tank:
Max from 467k BBL Tanks for all products + max from 373k BBL Tanks for all products + 310k BBL Tanks + max from 202k BBL Tanks for all products + 12.6k BBL Tanks + 1k BBL Tanks
[3] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of crude and condensate.
[4] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum sum of Roof Landing (at 4'4") + maximum of Controlled Degassing of crude and condensate.
[5] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of Uncontrolled Venting of crude and condensate.
[6] Emissions are the sum of Product Change Landings + Controlled Degassing + Uncontrolled Venting.
[7] Maximum short-term emissions (lb/hr) are the maximum of each activity which uses EPN: VCU-4 or PORTVC. Only one activity will occur in the worst-case hour.
Annual emissions (tpy) are the sum of Product Change Landings + Controlled Degassing from all tanks.
[8] Maximum short-term emissions (lb/hr) are the maximum emissions from EPN: VCU-4, PORTVC, or MSS-ATM.
Annual emissions (tpy) are the sum of EPNs: VCU-4, PORTVC and MSS-ATM.

Table 14
MSS Summary - H_2S Emissions (EPNs VCU-4 and MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks

		Maximum Short-term Emissions (lb/hr)									Maximum Short-term Emissions [1] (lb/hr)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
Roof Landings (at 3'2")											
Standing	VCU-4	1.15E-03	9.56E-05			1.15E-03					1.15E-03
Refilling	VCU-4	4.42E-04	1.97E-04			4.42E-04					4.42E-04
Standing	PORTVC	1.15E-03	9.56E-05	9.44E-04	7.83E-05		5.12E-04	4.25E-05	--	1.21E-05	1.15E-03
Refilling	PORTVC	4.42E-04	1.97E-04	4.42E-04	1.97E-04		4.42E-04	1.97E-04	--	1.81E-05	4.42E-04
Roof Landing (at 4'4")											
Refilling	VCU-4	4.42E-04	1.97E-04			4.42E-04					4.42E-04
Controlled Degassing	VCU-4	2.15E-03	1.19E-04			2.15E-03					2.15E-03
Roof Landing (at 4'4")											
Refilling	PORTVC	4.42E-04	1.97E-04	4.42E-04	1.97E-04		4.42E-04	1.97E-04	1.14E-04	2.48E-05	4.42E-04
Controlled Degassing	PORTVC	2.15E-03	1.19E-04	2.15E-03	1.19E-04		2.15E-03	1.19E-04	3.93E-04	8.60E-05	2.15E-03
Uncontrolled Venting	MSS-ATM	0.27	0.12	0.22	0.10	0.27	0.12	0.05	0.01	2.84E-03	0.27

		Annual Emissions (tpy)									Annual DEFR Emissions [2] (tpy)
		467k BBL Tanks		373k BBL Tanks		310k BBL Tanks	202k BBL Tanks		12.6k BBL Tanks	1k BBL Tanks	
Activity	EPN	Crude Oil	Condensate	Crude Oil	Condensate	Crude Oil	Crude Oil	Condensate	Crude Oil	Crude Oil	
VCU-4											
Roof Landings (at 3'2")	VCU-4	3.46E-05	5.37E-06	--	--	5.19E-05	--	--	--	--	8.65E-05
Roof Landing (at 4'4")	VCU-4	2.17E-05	3.25E-06	--	--	3.25E-05	--	--	--	--	5.42E-05
Controlled Degassing	VCU-4	1.64E-05	9.06E-07	--	--	2.46E-05	--	--	--	--	4.10E-05
PORTVC											
Roof Landings (at 3'2")	PORTVC	2.68E-04	4.16E-05	1.42E-05	2.20E-06	--	2.81E-03	5.97E-07	--	1.81E-07	3.09E-03
Roof Landing (at 4'4")	PORTVC	1.68E-04	2.52E-05	8.87E-06	1.33E-06	--	2.41E-06	3.61E-07	5.20E-07	1.14E-07	1.80E-04
Controlled Degassing	PORTVC	1.27E-04	7.02E-06	6.71E-06	3.71E-07	--	1.82E-06	1.01E-07	3.93E-07	8.60E-08	1.36E-04
MSS-ATM											
Uncontrolled Venting	MSS-ATM	4.74E-03	2.12E-03	2.22E-04	9.89E-05	8.12E-04	6.01E-05	2.69E-05	1.30E-05	2.84E-06	5.85E-03

Worst-Case Annual Emissions Determination

		Annual Emissions (tpy)					
Activity	EPN	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
VCU-4							
Product Change Landings [3]	VCU-4	3.46E-05	--	5.19E-05	--	--	--
Controlled Degassing [4]	VCU-4	3.81E-05	--	5.71E-05	--	--	--
PORTVC							
Product Change Landings [3]	PORTVC	2.68E-04	1.42E-05	--	2.81E-03	--	1.81E-07
Controlled Degassing [4]	PORTVC	2.95E-04	1.56E-05	--	4.23E-06	9.13E-07	2.00E-07
MSS-ATM							
Uncontrolled Venting [5]	MSS-ATM	4.74E-03	2.22E-04	8.12E-04	6.01E-05	1.30E-05	2.84E-06
Maximum [6]	**MSS Limit**	**5.37E-03**	**2.51E-04**	**9.21E-04**	**2.88E-03**	**1.39E-05**	**3.22E-06**

Emissions Summary

EPN	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
VCU-4 [7]	2.15E-03	1.82E-04
PORTVC [7]	2.15E-03	3.41E-03
MSS-ATM	0.27	5.85E-03
MSS Limit [8]	**0.27**	**9.44E-03**

Notes:
[1] Maximum short-term emissions (lb/hr) are the maximum emissions of all products in each tank size, per activity. Only one activity will occur in the worst-case hour.
[2] Annual emissions (tpy) are the sum of the maximum emissions per product, per tank:
Max from 467k BBL Tanks for all products + max from 373k BBL Tanks for all products + 310k BBL Tanks + max from 202k BBL Tanks for all products + 12.6k BBL Tanks + 1k BBL Tanks
[3] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of crude and condensate.
[4] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum sum of Roof Landing (at 4'4") + maximum of Controlled Degassing of crude and condensate.
[5] For the 467k, 373k, and 202k BBL tanks, emissions are the maximum of Uncontrolled Venting of crude and condensate.
[6] Emissions are the sum of Product Change Landings + Controlled Degassing + Uncontrolled Venting.
[7] Maximum short-term emissions (lb/hr) are the maximum of each activity which uses EPN: VCU-4 or PORTVC. Only one activity will occur in the worst-case hour.
Annual emissions (tpy) are the sum of Product Change Landings + Controlled Degassing from all tanks.
[8] Maximum short-term emissions (lb/hr) are the maximum emissions from EPN: VCU-4, PORTVC, or MSS-ATM.
Annual emissions (tpy) are the sum of EPNs: VCU-4, PORTVC and MSS-ATM.

Table 15
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs VCU-4 and PORTVC) - <u>Crude Oil</u>
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Input	VCU-4	PORTVC	Unit
NOx Emission Factor [1]	0.10	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	7.45E-03	lb/MMBtu
DRE	99.9%	99.9%	%
Heating Value of Product [3]	19,580	19,580	Btu/lb

<u>**VOCs to Control Device**</u>

Activity	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy) [5]						
Roof Landings														
Standing Idle	421.63	421.63	345.15	421.63	187.39	--	4.42	20.24	156.85	8.28	30.36	2.25	--	0.11
Refilling	323.49	323.49	323.49	323.49	323.49	--	13.26	5.06	39.21	2.07	7.59	0.56	--	0.03
Degassing														
Refilling	323.49	323.49	323.49	323.49	323.49	83.05	18.14	3.46	26.83	1.42	5.19	0.38	0.08	0.02
Degassing	392.73	392.73	392.73	392.73	392.73	287.85	62.88	12.00	92.99	4.91	18.00	1.33	0.29	0.06

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-101, T-102, T-104, T-105, T-107, and T-108 are the 310,000-bbl tanks and tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.

<u>**Combustion Emissions**</u>

Activity	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy)						
NOx [6]														
Roof Landings														
Standing Idle	0.83	0.83	0.68	0.83	0.37	--	8.65E-03	0.08	0.61	0.03	0.12	8.81E-03	--	4.15E-04
Refilling	0.63	0.63	0.63	0.63	0.63	--	0.03	9.91E-03	0.08	4.05E-03	0.01	1.10E-03	--	2.13E-06
Degassing														
Refilling	0.63	0.63	0.63	0.63	0.63	0.16	0.04	6.78E-03	0.05	2.77E-03	0.01	7.53E-04	4.18E-05	1.99E-06
Degassing	0.77	0.77	0.77	0.77	0.77	0.56	0.12	0.02	0.18	9.62E-03	0.04	2.61E-03	4.13E-04	1.97E-05
TOTAL [7]								**0.12**	**0.93**	**0.05**	**0.18**	**0.01**	**4.55E-04**	**4.39E-04**
CO [6]														
Roof Landings														
Standing Idle	0.55	0.55	0.45	0.55	0.25	--	5.79E-03	0.05	0.41	0.02	0.08	5.89E-03	--	2.78E-04
Refilling	0.42	0.42	0.42	0.42	0.42	--	0.02	6.62E-03	0.05	2.71E-03	9.94E-03	7.36E-04	--	1.42E-06
Degassing														
Refilling	0.42	0.42	0.42	0.42	0.42	0.11	0.02	4.53E-03	0.04	1.86E-03	6.80E-03	5.04E-04	2.79E-05	1.33E-06
Degassing	0.51	0.51	0.51	0.51	0.51	0.38	0.08	0.02	0.12	6.43E-03	0.02	1.75E-03	2.76E-04	1.32E-05
TOTAL [7]								**0.08**	**0.62**	**0.03**	**0.12**	**8.87E-03**	**3.04E-04**	**2.94E-04**

Table 15
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs VCU-4 and PORTVC) - Crude Oil
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Activity	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	310k BBL Tanks	202k BBL Tanks	12.6k BBL Tanks	1k BBL Tanks
	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]							(tpy)						
$PM/PM_{10}/PM_{2.5}$ [6]														
Roof Landings														
Standing Idle	0.06	0.06	0.05	0.06	0.03	--	6.45E-04	2.95E-03	0.02	1.21E-03	4.43E-03	3.28E-04	--	1.55E-05
Refilling	0.05	0.05	0.05	0.05	0.05	--	1.93E-03	7.38E-04	5.72E-03	3.02E-04	1.11E-03	8.20E-05	--	3.87E-06
Degassing														
Refilling	0.05	0.05	0.05	0.05	0.05	0.01	2.65E-03	5.05E-04	3.91E-03	2.07E-04	7.58E-04	5.61E-05	1.21E-05	2.65E-06
Degassing	0.06	0.06	0.06	0.06	0.06	0.04	9.17E-03	1.75E-03	0.01	7.16E-04	2.63E-03	1.94E-04	4.20E-05	9.17E-06
TOTAL [7]								**5.95E-03**	**0.05**	**2.43E-03**	**8.92E-03**	**6.61E-04**	**5.41E-05**	**3.12E-05**
SO_2 [8]														
Roof Landings														
Standing Idle	2.16	2.16	1.77	2.16	0.96	--	0.02	0.05	0.40	0.02	0.08	5.77E-03	--	0.25
Refilling	0.83	0.83	0.83	0.83	0.83	--	0.83	0.01	0.10	5.32E-03	0.02	1.44E-03	--	0.07
Degassing														
Refilling	0.83	0.83	0.83	0.83	0.83	0.83	0.83	8.89E-03	0.07	3.64E-03	0.01	9.87E-04	2.13E-04	4.66E-05
Degassing	0.03	0.03	0.03	0.03	0.03	5.58E-03	1.22E-03	0.03	0.24	0.01	0.05	3.42E-03	7.39E-04	1.61E-04
TOTAL [7]								**0.10**	**0.81**	**0.04**	**0.16**	**0.01**	**9.52E-04**	**0.32**

Notes:

[1] Emission factors for VCU-4 obtained from stack testing of vapor combustors at the site. The maximum emission factor from any of the test runs is conservatively used to estimate emissions.
Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers.

[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 µm in diameter, therefore $PM = PM_{10} = PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).

[3] Higher Heating Value from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010.

[4] Lb/hr values for VOC and SO_2 are from Tables 9 and 11.
Standing idle VOC losses are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by 12 hours. This assumes that a roof is landed for at least half a day.
Refilling VOC losses are the total uncontrolled VOC filling losses (lb/tank/event) divided by the refilling duration.
Degassing VOC emissions are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by the degassing duration.
NO_X, CO, and PM emissions are calculated based on the VOCs to Control Device (lb/hr) × Heating Value of Product (Btu/lb) × Emission factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
SO_2 emissions are calculated in Tables 9 and 11.

[5] Calculated according to the following equations:
[a] Standing Idle and Refilling: (Standing Idle Losses/Tank or Refilling Losses/Tank) × Controlled Roof Landing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table 9 for Roof Landing Episodes/Year/Tank and Number of Tanks
[b] Degassing: (Uncontrolled VOC Standing Idle Losses/Tank/Episode - Uncontrolled VOC Venting Losses/Tank/Episode) × Controlled Degassing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table 11 for Degassing Episodes/Year/Tank and Number of Tanks

[6] Calculated according to the following equations:
[a] Standing Idle and Refilling: Annual VOCs from Standing Idle and Refilling (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
[b] Degassing: Annual VOCs from Degassing (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu

[7] The totals are calculated as follows: Tpy: Sum of Roof Landings (Standing Idle + Refilling) and Degassing (Refilling + Degassing).

[8] Annual emissions are calculated in Tables 9 and 11.

Conversions:

2,000 lb/ton
1,000,000 Btu/MMBtu

Table 16
Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs VCU-4 and PORTVC) - Condensate
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Input	VCU-4	PORTVC	Unit
NOx Emission Factor [1]	0.10	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	7.45E-03	lb/MMBtu
DRE	99.9%	99.9%	%
Heating Value of Product [3]	20,007	20,007	Btu/lb

VOCs to Control Device

Activity	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks
	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]				(tpy) [5]			
Roof Landings								
Standing Idle	101.83	101.83	83.36	45.26	4.89	37.88	2.00	0.54
Refilling	418.51	418.51	418.51	418.51	6.55	50.73	2.68	0.73
Degassing								
Refilling	418.51	418.51	418.51	418.51	4.48	34.71	1.83	0.50
Degassing	63.14	63.14	63.14	63.14	1.93	14.95	0.79	0.21

The permanent VCU (EPN VCU-4) is used to control tanks T-101 through T-108, T-110, and T-111. Tanks T-103, T-106, T-110, and T-111 are 467,000-bbl tanks.
The other tanks do not store condensate.

Combustion Emissions

Activity	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks	467k BBL Tanks	467k BBL Tanks	373k BBL Tanks	202k BBL Tanks
	VCU-4	PORTVC	PORTVC	PORTVC	VCU-4	PORTVC	PORTVC	PORTVC
	(lb/hr) [4]				(tpy)			
NOx [6]								
Roof Landings								
Standing Idle	0.20	0.20	0.17	0.09	0.02	0.15	8.01E-03	2.17E-03
Refilling	0.84	0.84	0.84	0.84	0.01	0.10	5.36E-03	1.46E-03
Degassing								
Refilling	0.84	0.84	0.84	0.84	8.96E-03	0.07	3.67E-03	9.96E-04
Degassing	0.13	0.13	0.13	0.13	3.86E-03	0.03	1.58E-03	4.29E-04
TOTAL [7]					**0.05**	**0.35**	**0.02**	**5.05E-03**
CO [6]								
Roof Landings								
Standing Idle	0.14	0.14	0.11	0.06	0.01	0.10	5.35E-03	1.45E-03
Refilling	0.56	0.56	0.56	0.56	8.76E-03	0.07	3.58E-03	9.73E-04
Degassing								
Refilling	0.56	0.56	0.56	0.56	5.99E-03	0.05	2.45E-03	6.66E-04
Degassing	0.08	0.08	0.08	0.08	2.58E-03	0.02	1.06E-03	2.87E-04
TOTAL [7]					**0.03**	**0.24**	**0.01**	**3.38E-03**

Table 16

Storage Tank Roof Landing and Degassing Combustion Emissions (EPNs VCU-4 and PORTVC) - Condensate

Moda Ingleside Energy Center

Moda Ingleside Facilities, LLC = Updated as part of retroactive PSD analysis associated with January 2021 permitting action

REVISED JANUARY 2021

Activity	467k BBL Tanks VCU-4	467k BBL Tanks PORTVC	373k BBL Tanks PORTVC	202k BBL Tanks PORTVC	467k BBL Tanks VCU-4	467k BBL Tanks PORTVC	373k BBL Tanks PORTVC	202k BBL Tanks PORTVC
	(lb/hr) [4]				(tpy)			
$PM/PM_{10}/PM_{2.5}$ [6]								
Roof Landings								
Standing Idle	0.02	0.02	0.01	6.75E-03	7.29E-04	5.65E-03	2.98E-04	8.10E-05
Refilling	0.06	0.06	0.06	0.06	9.76E-04	7.56E-03	3.99E-04	1.08E-04
Degassing								
Refilling	0.06	0.06	0.06	0.06	6.68E-04	5.17E-03	2.73E-04	7.42E-05
Degassing	9.41E-03	9.41E-03	9.41E-03	9.41E-03	2.88E-04	2.23E-03	1.18E-04	3.20E-05
TOTAL [7]					**2.66E-03**	**0.02**	**1.09E-03**	**2.96E-04**
SO_2 [8]								
Roof Landings								
Standing Idle	0.18	0.18	0.15	0.08	4.31E-03	0.03	1.76E-03	4.79E-04
Refilling	0.37	0.37	0.37	0.37	5.77E-03	0.04	2.36E-03	6.41E-04
Degassing								
Refilling	0.37	0.37	0.37	0.37	3.95E-03	0.03	1.62E-03	4.39E-04
Degassing	6.01E-03	6.01E-03	6.01E-03	6.01E-03	1.70E-03	0.01	6.96E-04	1.89E-04
TOTAL [7]					**0.02**	**0.12**	**6.44E-03**	**1.75E-03**

Notes:

[1] Emission factors for VCU-4 obtained from stack testing of vapor combustors at the site. The maximum emission factor from any of the test runs is conservatively used to estimate emissions.
Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers.

[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 µm in diameter, therefore $PM = PM_{10} = PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).

[3] Higher Heating Value from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.

[4] Lb/hr values for VOC and SO_2 are from Tables 10 and 12.
Standing idle VOC losses are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by 12 hours. This assumes that a roof is landed for at least half a day.
Refilling VOC losses are the total uncontrolled VOC filling losses (lb/tank/event) divided by the refilling duration.
Degassing VOC emissions are the total uncontrolled VOC standing idle losses (lb/tank/event) divided by the degassing duration.
NO_X, CO, and PM emissions are calculated based on the VOCs to Control Device (lb/hr) × Heating Value of Product (Btu/lb) × Emission factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
SO_2 emissions are calculated in Tables 10 and 12.

[5] Calculated according to the following equations:
[a] Standing Idle and Refilling: (Standing Idle Losses/Tank or Refilling Losses/Tank) × Controlled Roof Landing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table 10 for Roof Landing Episodes/Year/Tank and Number of Tanks
[b] Degassing: (Uncontrolled VOC Standing Idle Losses/Tank/Episode - Uncontrolled VOC Venting Losses/Tank/Episode) × Controlled Degassing Episodes/Year/Tank × Number of Tanks ÷ 2,000 lb/ton
*See Table 12 for Degassing Episodes/Year/Tank and Number of Tanks

[6] Calculated according to the following equations:
[a] Standing Idle and Refilling: Annual VOCs from Standing Idle and Refilling (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu
[b] Degassing: Annual VOCs from Degassing (tpy) × Heating Value of Product (Btu/lb) × Emission Factor (lb/MMBtu) ÷ 1,000,000 Btu/MMBtu

[7] The totals are calculated as follows: Tpy: Sum of Roof Landings (Standing Idle + Refilling) and Degassing (Refilling + Degassing).

[8] Annual emissions are calculated in Tables 10 and 12.

Conversions:

2,000 lb/ton
1,000,000 Btu/MMBtu

Table 17
Tank Truck Loading Emissions (EPNs VCU-4 and TRUCKLOAD)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Data Type		Units and/or Constants	Truck Loading: Crude	Truck Loading: Condensate	Notes
Loading Data	Vessel Type		Truck	Truck	
	Vapor Collection Efficiency	%	99.2%	99.2%	Per NSR Permit No. 122362, S.C. 21.D., tank trucks must comply with testing in MACT Subpart R.
	Vapor Destruction Efficiency	%	99.9%	99.9%	
	Saturation Factor	S	0.6	0.6	
Constants, Conversions, and Combustion Device Emission Factors	Loading Loss Equation	-	12.46	12.46	
	gal/bbl	BC	42	42	
	lbs/ton	-	2000	2000	
	H_2S Emission Factor	lb H_2S/lb VOC	0.0011	0.0004	
	NO_X Emission Factor	lb/MMBtu	0.1	0.1	
	CO Emission Factor	lb/MMBtu	0.07	0.07	
	$PM/PM_{10}/PM_{2.5}$ Emission Factor	lb/MMBtu	0.0075	0.0075	
Product Physical Property Data	Vapor Molecular Weight	M (lb/lb-mole)	50	65	
	Vapor Heat Content	Btu/lb	19,580	20,007	Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
	Maximum True Vapor Pressure	P (psia)	11.00	11.00	
	Annual Average True Vapor Pressure	P (psia)	8.74	8.70	
	Maximum Product Loading Temperature	T (°R)	555	555	
	Annual Average Product Loading Temperature	T (°R)	530	530	
VOC Loading Loss Factor	Short-term Loading Loss (Total)	lb/1,000 gal loaded	7.41	9.63	= 12.46 × SPM/T (maximum)
	Annual Loading Loss (Total)	lb/1,000 gal loaded	6.16	7.97	= 12.46 × SPM/T (average)
Product Throughput	Short-term	bbl/hr	900	900	
		gal/hr	37,800	37,800	= bbl/hr × 42 gal/bbl
	Annual	bbl/yr	26,400	26,400	
		gal/yr	1,108,800	1,108,800	= bbl/yr × 42 gal/bbl
Uncollected Loading Loss Emissions (EPN TRUCKLOAD)	Maximum Short-term VOC	lb/hr	2.24	2.91	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × (1 - Vapor Collection Efficiency %)
	Annual VOC	tpy	0.03	0.04	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × (1 - Vapor Collection Efficiency %)
	Maximum Short-term H_2S	lb/hr	2.43E-03	1.08E-03	= Maximum Short-term VOC (lb/hr) × H_2S Emission Factor (lb H_2S/lb VOC)
	Annual H_2S	tpy	2.97E-05	1.31E-05	= Annual VOC (tpy) × H_2S Emission Factor (lb H_2S/lb VOC)
Collected and Controlled Emissions (EPN VCU-4)	Maximum Short-term VOC	lb/hr	0.28	0.36	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Annual VOC	tpy	3.39E-03	4.39E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Maximum Short-term H_2S	lb/hr	3.02E-04	1.34E-04	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Annual H_2S	tpy	3.68E-06	1.63E-06	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × (1 - Vapor Destruction Efficiency %)
	Maximum Short-term NO_X	lb/hr	0.54	0.72	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual NO_X	tpy	6.64E-03	8.77E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term CO	lb/hr	0.36	0.48	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual CO	tpy	4.44E-03	5.87E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term $PM/PM_{10}/PM_{2.5}$	lb/hr	0.04	0.05	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Annual $PM/PM_{10}/PM_{2.5}$	tpy	4.95E-04	6.54E-04	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % × Heating Value (Btu/lb) × Emission Factor (lb/MMBtu) × Conversion (1 MMBtu/1,000,000 Btu)
	Maximum Short-term SO_2	lb/hr	0.57	0.25	= Short-term Loading Loss (lb/1,000 gal loaded) × Short-term Throughput (gal/hr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) × Vapor Collection Efficiency % ÷ MW H_2S (34.08 lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (64 lb/lb-mole)
	Annual SO_2	tpy	6.91E-03	3.06E-03	= Annual Loading Loss (lb/1,000 gal loaded) × Annual Throughput (gal/yr) ÷ 1,000 × H_2S Emission Factor (lb H_2S/lb VOC) ÷ Conversion (2,000 lb/ton) × Vapor Collection Efficiency % ÷ MW H_2S (34.08 lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (64 lb/lb-mole)

Table 18
Equipment MSS (EPN MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

Emissions Summary

			EPN MSS-ATM							
			Crude				Condensate			
			VOC		H_2S		VOC		H_2S	
Source	FIN	EPN	lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year
Equipment MSS Vapors Vented	EQDEGAS	MSS-ATM, MSS-CONT	78.54	0.84	0.09	9.13E-04	102.11	1.09	0.04	4.06E-04
Equipment Draining	EQDRAIN	MSS-ATM	15.47	0.23	0.02	2.54E-04	20.12	0.30	7.47E-03	1.13E-04
Equipment Vapor Space Emissions Atmosphere Post Control	EQDGSATM	MSS-ATM	6.88	0.14	7.47E-03	1.51E-04	8.94	0.18	3.32E-03	6.69E-05
Equipment MSS Refilling	EQREFILL	MSS-ATM, MSS-CONT	47.13	0.50	0.05	5.48E-04	61.27	0.66	0.02	2.43E-04

*Vapors routed to control are not included in this table. EPNs MSS-ATM and MSS-CONT are listed for completeness in this table for activities that have vapors emitted to both the atmosphere and control. The above emissions are only for EPN MSS-ATM

Equipment ID	Variable	Units	Equation	Pump	Filter/Meter/ Valve	Vessels & Piping	Crude Emission Totals	Pump	Filter/Meter/ Valve	Vessels & Piping	Condensate Emission Totals
Short-Term Venting/Draining/Refilling Events		events/hr		5	5	1		5	5	1	
Annual Venting/Draining/Refilling Events		events/yr		144	70	44		144	70	44	
Molecular Weight of Vapor [1]	MW_V	lb/lb-mole		50	50	50		65	65	65	
Daily Avg. Liquid Surface Temp.	T	°F		95	95	95		95	95	95	
		°R	°F + 459.67	554.67	554.67	554.67		554.67	554.67	554.67	
Vapor Pressure at Max. Storage Temp.	VP	psia	Must be less than 11.0 psia according to 30 TAC §106.478	11.00	11.00	11.00		11.00	11.00	11.00	
Volume	V	ft^3/event		85.00	85.00	4,363.00		85.00	85.00	4,363.00	
Equipment MSS Vapors Vented (EPNs MSS-ATM and MSS-CONT)											
Vented to Control		Yes/No		No	No	Yes		No	No	Yes	
Moles [2]	n	moles/event	n = PV/RT	0.16	0.16	8.06		0.16	0.16	8.06	
Vented VOC Emissions (No control: FIN EQDEGAS, EPN MSS-ATM, Control: FIN EQDEGAS, EPN MSS-CONT)		lb/hr [3]	n (moles/event) × MW_V (lb/lb-mole) × Short-term events (events/hr)	39.27	39.27	403.16	***78.54***	51.05	51.05	524.10	***102.11***
		tons/year [3]	n (moles/event) × MW_V (lb/lb-mole) × Annual events (events/year) × Equipment count ÷ 2,000 lb/ton	0.57	0.27	8.87	***0.84***	0.74	0.36	11.53	***1.09***
Equipment Draining (FIN EQDRAIN, EPN MSS-ATM)											
Equipment Draining VOC Loading Loss [4]	L_L	lb/1,000 gals loaded	AP-42 Section 5.2, Equation (1): L_L = 12.46 × SPM/T, where S = 0.6 from Table 5.2-1 for tank trucks and rail cars, submerged loading: dedicated normal service	7.41	7.41	7.41		9.64	9.64	9.64	
Equipment Draining VOC Loss		lb/event	Equipment volume: 20% of pump, filter, meter, and valve volume, 2.5% of piping volume Volume (ft^3/event) × 7.48 gal/ft^3 × L_L (lb/1,000 gal) ÷ 1,000 × 20% or 2.5%	0.94	0.94	6.05		1.23	1.23	7.86	
Equipment Draining VOC Emissions (FIN EQDRAIN, EPN MSS-ATM)		lb/hr	VOC Loss (lb/event) × Short-term events (events/hr)	4.71	4.71	6.05	***15.47***	6.13	6.13	7.86	***20.12***
		tons/year	VOC Loss (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	0.07	0.03	0.13	***0.23***	0.09	0.04	0.17	***0.30***
Equipment Vapor Space Emissions (Vapor Space Volume > 10 ft^3) to Atmosphere Post Control (EPN MSS-ATM)											
Vented Vapor Space VOC Emissions after Control (10,000 ppm)		lb/event	10,000 parts per million ÷ 1,000,000 parts/million parts × Volume (ft^3/event) × MW_V (lb/lb-mole) ÷ 379 ft^3/lb-mole	0.11	0.11	5.76		0.15	0.15	7.48	
Venting Duration		hrs/event		1.0	1.0	1.0		1.0	1.0	1.0	
Vented Vapor Space VOC Emissions after Control (10,000 ppm) (FIN EQDGSATM, EPN MSS-ATM)		lb/hr	Vented VOC (lb/event) ÷ Event Duration (hrs/event) × Short-term events (events/hr)	0.56	0.56	5.76	***6.88***	0.73	0.73	7.48	***8.94***
		tons/year	Vented VOC (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	8.07E-03	3.92E-03	0.13	***0.14***	0.01	5.10E-03	0.16	***0.18***

Table 18
Equipment MSS (EPN MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Crude H_2S Emission Factor	**0.0011**	**lb H_2S/lb VOC**
Condensate H_2S Emission Factor	**0.0004**	**lb H_2S/lb VOC**

Emissions Summary

Source	FIN	EPN	EPN MSS-ATM							
			Crude				Condensate			
			VOC		H_2S		VOC		H_2S	
			lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year	lb/hr	tons/year
Equipment MSS Vapors Vented	EQDEGAS	MSS-ATM, MSS-CONT	78.54	0.84	0.09	9.13E-04	102.11	1.09	0.04	4.06E-04
Equipment Draining	EQDRAIN	MSS-ATM	15.47	0.23	0.02	2.54E-04	20.12	0.30	7.47E-03	1.13E-04
Equipment Vapor Space Emissions Atmosphere Post Control	EQDGSATM	MSS-ATM	6.88	0.14	7.47E-03	1.51E-04	8.94	0.18	3.32E-03	6.69E-05
Equipment MSS Refilling	EQREFILL	MSS-ATM, MSS-CONT	47.13	0.50	0.05	5.48E-04	61.27	0.66	0.02	2.43E-04

*Vapors routed to control are not included in this table. EPNs MSS-ATM and MSS-CONT are listed for completeness in this table for activities that have vapors emitted to both the atmosphere and control. The above emissions are only for EPN MSS-ATM

Equipment ID	Variable	Units	Equation	Pump	Filter/Meter/ Valve	Vessels & Piping	Crude Emission Totals	Pump	Filter/Meter/ Valve	Vessels & Piping	Condensate Emission Totals
Equipment MSS Refilling (EPNs MSS-ATM and MSS-CONT)											
Vented to Control		Yes/No		No	No	Yes		No	No	Yes	
Equipment VOC Loading Loss	L_L	lb/1,000 gals loaded	AP-42 Section 5.2, Equation (1): L_L = 12.46 × SPM/T, where S = 0.6 from Table 5.2-1 for tank trucks and rail cars, submerged loading: dedicated normal service	7.41	7.41	7.41		9.64	9.64	9.64	
Recovery VOC Loss		lb/event	Volume (ft^3/event) × 7.48 gal/ft^3 × L_L (lb/1,000 gal) ÷ 1,000	4.71	4.71	241.93		6.13	6.13	314.50	
Recovery VOC Emissions (No control: FIN EQREFILL, EPN MSS-ATM, Control: FIN EQREFILL, EPN MSS-CONT)		lb/hr [3]	VOC Loss (lb/event) × Short-term events (events/hr)	23.57	23.57	241.93	***47.13***	30.64	30.64	314.50	***61.27***
		tons/year [3]	VOC Loss (lb/event) × Annual events (events/year) ÷ 2,000 lb/ton	0.34	0.16	5.32	***0.50***	0.44	0.21	6.92	***0.66***

Notes:
[1] From EPA TANKS 4.09d: Crude oil (RVP 5) for crude and gasoline (RVP 11.5) for condensate.
[2] Where: P = vapor pressure, psia
V = volume, ft^3/event
R = Ideal Gas Constant, 10.731 psia-ft^3/lb-mole-°R
T = temperature, °R
[3] Total is the sum of uncontrolled emissions.
[4] Where: L_L = loading loss, lb/10^3 gal of liquid loaded
S = saturation factor from AP-42 Section 5.2, Table 5.2-1
P = true vapor pressure, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R

Conversions:

2,000	lb/ton
7.48	gal/ft^3
379	ft^3/lb-mole at 60°F and 14.7 psia
1,000,000	parts/million parts

Table 19
Air Mover and Vacuum Truck MSS Emissions (EPNs MSS-ATM and MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Parameter	Value	Units
Loading Temperature	95	°F
	554.67	°R
Saturation Factor [1]	1.45	
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

EPN	Truck Type and Load Method	Material	TVP [2] (psia)	Vapor MW [3] (lb/lb-mole)	Loading Loss [4] (lb/1,000 gal)	Loading Loss (lb/1,000 bbl)	Liquid Throughput [5] (bbl/hr)	Liquid Throughput [5] (bbl/yr)	Vapor Displacement [6] (bbl/hr)	Vapor Displacement [6] (bbl/yr)	Uncontrolled Vacuum Truck VOC Emissions [7] (lb/hr)	Uncontrolled Vacuum Truck VOC Emissions [7] (tons/year)	Control Efficiency [8]	Controlled Vacuum Truck VOC Emissions [9] (lb/hr)	Controlled Vacuum Truck VOC Emissions [9] (tons/year)	Vacuum Truck H_2S Emissions [10] (lb/hr)	Vacuum Truck H_2S Emissions [10] (tons/year)
Crude																	
MSS-CONT	Air Mover & Vacuum Mover - Thermal Control	High VP Products	11.00	50	17.91	752.43	85	6,800	170	13,600	127.91	5.12	99.9%	0.13	5.12E-03	1.39E-04	5.56E-06
MSS-CONT	Air Mover & Vacuum Mover - Carbon Control	High VP Products	11.00	50	--	--	85	6,800	170	13,600	--	--	100 ppm	0.01	5.04E-04	1.37E-05	5.47E-07
MSS-ATM	Air Mover & Vacuum Mover - No Control	Low VP Materials	0.5	130	2.12	88.92	85	6,800	170	13,600	15.12	0.60	0%	--	--	0.02	6.57E-04
Condensate																	
MSS-CONT	Air Mover & Vacuum Mover - Thermal Control	High VP Products	11.00	65	23.29	978.15	85	6,800	170	13,600	166.29	6.65	99.9%	0.17	6.65E-03	6.17E-05	2.47E-06
MSS-CONT	Air Mover & Vacuum Mover - Carbon Control	High VP Products	11.00	65	--	--	85	6,800	170	13,600	--	--	100 ppm	0.02	6.55E-04	6.08E-06	2.43E-07
MSS-ATM	Air Mover & Vacuum Mover - No Control	Low VP Materials	0.5	130	2.12	88.92	85	6,800	170	13,600	15.12	0.60	0%	--	--	5.61E-03	2.24E-04

Emissions Summary

EPN	VOC Maximum Short-term Emissions [11] (lb/hr)	VOC Annual Emissions [12] (tons/year)	H_2S Maximum Short-term Emissions [11] (lb/hr)	H_2S Annual Emissions [12] (tons/year)
MSS-CONT	0.17	7.31E-03	1.39E-04	6.10E-06
MSS-ATM	15.12	0.60	0.02	6.57E-04

Calculation for Carbon Control Emissions

$$Vapor\ Displacement\ (bbl/hr) \times Conversion\ \left(\frac{42\ gal}{bbl}\right) \div Conversion\ \left(\frac{7.48\ gal}{ft^3}\right) \div Conversion\ \left(\frac{379\ ft^3}{lb-mole}\right) \times MW_V\ \left(\frac{lb}{lb-mole}\right) \times \frac{100\ parts}{million\ parts} \div Conversion\ \left(\frac{1{,}000{,}000\ parts}{million\ parts}\right) = VOC\ \ lb/hr$$

Notes:

[1] Thermal Control: Saturation factor = 1.45, from AP-42 Section 5.2, Table 5.2-1, factor for tank trucks and rail cars, splash loading: dedicated normal service.
[2] Products with vapor pressures ≤ 0.5 psia do not require control according to BACT for Vacuum Trucks in Section IV.3.A.(3) of the TCEQ's MSS Guidance (September 2012). Low VP materials at the site are considered to be settled materials from tank bottom or storage containers.
[3] Vapor MW for "high VP products" is based on crude oil RVP 5, from Table 7.1-2 in AP-42 Section 7.1. Vapor MW for "low VP materials" is based on distillate fuel oil no. 2, from Table 7.1-2 In AP-42 Section 7.1.
[4] Calculated using Equation 1 from AP-42 Section 5.2:
L_L = 12.46*(SPM/T)
Where: L_L = loading loss, lb/1,000 gal liquid loaded
S = saturation factor, dimensionless
P = true vapor pressure of liquid loaded, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R
[5] Annual throughput assumes that each loading takes one hour.
[6] Assumed that the vapor volume displaced is twice the liquid throughput according to Section IV.2.A. of the TCEQ's MSS Guidance (September 2012).
[7] Calculated according to the following equation: Loading loss (lb/1,000 bbl) ÷ 1,000 × Liquid Throughput (bbl/hr or bbl/yr) ÷ 2,000 lb/ton (for tons/year calculation only)
[8] Control efficiency based on the breakthrough concentration of the carbon control according to Section IV.3.A.(3) of the TCEQ's MSS Guidance (September 2012).
[9] Carbon controlled emissions based on the breakthrough concentration: Vapor Displacement (bbl/hr) × 42 gal/bbl × 7.48 gal/ft^3 ÷ 379 ft^3/lb-mole × MW (lb/lb-mole) × 100 ppm ÷ 1,000,000 parts/million parts
[10] Thermal control emissions calculated according to the following equation: Loading loss (lb/1,000 bbl) ÷ 1,000 × Liquid Throughput (bbl/hr or bbl/yr) × H_2S Emission Factor (lb H_2S/lb VOC) × (1 - Control Efficiency %) ÷ 2,000 lb/ton (for tons/year calculation only)
Carbon control emissions calculated according to the following equation: Controlled vacuum truck VOC emissions (lb/hr or tons/year) × H_2S Emission Factor (lb H_2S/lb VOC)
No control emissions calculated according to the following equation: Uncontrolled vacuum truck VOC emissions (lb/hr or tons/year) × H_2S Emission Factor (lb H_2S/lb VOC)
[11] Hourly emissions for EPN MSS-CONT are the maximum of the high vapor pressure products (thermal control and carbon control). Hourly emissions for EPN MSS-ATM are from low vapor pressure products (no control).
The maximum of crude and condensate is used to represent maximum hourly emissions.
[12] Annual emissions from EPN MSS-CONT are the maximum sum of the high vapor pressure products (thermal control and carbon control). Annual emissions from EPN MSS-ATM are from low vapor pressure products (no control).
The maximum of crude and condensate is used to represent maximum annual emissions.

Conversions:

42 gal/bbl
°R = °F + 459.67
2,000 lb/ton
7.48 gal/ft^3
379 ft^3/lb-mole at 60°F and 14.7 psia
1,000,000 parts/million parts

Table 20
Frac Tank Emissions (EPN MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Parameter	Value	Units
Loading Temperature	95	°F
	554.67	°R
Saturation Factor [1]	0.6	
Pumping Rate	50	bbl/hr
Frac Tank Volume	18,000	gal/tank
Simultaneous Loadings	10	tanks/hr
Annual Loading	17	tanks/year
Simultaneous Breathing	10	tanks/hr
DRE	99.9%	
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

Working Losses per Tank

							VOC		H_2S	
Product	Load Type	MW [2] (lb/lb-mole)	Maximum VP (psia)	Loading Loss Factor [3] (lb/1,000 gal)	Short-term Throughput (gal/hr)	Annual Throughput (gal/yr)	Short-term Emissions [4] (lb/hr)	Annual Emissions [4] (tons/year)	Short-term Emissions [4] (lb/hr)	Annual Emissions [4] (tons/year)
Crude	Submerged Load	50	11.00	7.41	2,100	306,000	**0.02**	**1.13E-03**	**1.69E-05**	**1.23E-06**
Condensate	Submerged Load	65	11.00	9.64	2,100	306,000	**0.02**	**1.47E-03**	**7.51E-06**	**5.47E-07**

Breathing Emissions per Tank

			Maximum VOC Breathing Losses [6] (lb/month)		Maximum H_2S Breathing Losses [6] (lb/month)	
Tank	Contents	Standing Time [5] (hrs/mo)	lb/month-tank	lb/hr-tank	lb/month-tank	lb/hr-tank
Frac Tank	Crude	720	1,043.31	1.45E-03	1.13	1.57E-06
Frac Tank	Condensate	720	621.52	8.63E-04	0.23	3.20E-07

Emissions Summary

	Crude				Condensate			
Emissions Source	Maximum Short-term VOC Emissions (lb/hr)	Annual VOC Emissions (tons/year)	Maximum Short-term H_2S Emissions (lb/hr)	Annual H_2S Emissions (tons/year)	Maximum Short-term VOC Emissions (lb/hr)	Annual VOC Emissions (tons/year)	Maximum Short-term H_2S Emissions (lb/hr)	Annual H_2S Emissions (tons/year)
Working Losses [7]	0.16	0.02	1.69E-04	2.09E-05	0.20	0.03	7.51E-05	9.31E-06
Breathing Losses [8], [9]	0.01	8.87E-03	1.57E-05	9.63E-06	8.63E-03	5.28E-03	3.20E-06	1.96E-06
TOTAL	**0.16**	**0.03**	**1.69E-04**	**3.06E-05**	**0.20**	**0.03**	**7.51E-05**	**1.13E-05**

Notes:
[1] Saturation factor = 0.6, from Table 5.2-1, factor for tank trucks and rail cars, submerged loading: dedicated normal service
[2] MW from Table 7.1-2 in AP-42 Section 7.1, crude is based on crude oil RVP 5, condensate is based on gasoline RVP 11.5
[3] Calculated using Equation 1 from AP-42 Section 5.2:
L_L = 12.46*(SPM/T)
Where: L_L = loading loss, lb/1,000 gal liquid loaded
S = saturation factor, dimensionless
P = true vapor pressure of liquid loaded, psia
M = molecular weight of vapors, lb/lb-mole
T = temperature of bulk liquid loaded, °R
[4] Short-term Emissions: Loading Loss Factor (lb/1,000 gal) × Short-term Throughput (gal/hr) × (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only)
Annual Emissions: Loading Loss Factor (lb/1,000 gal) × Annual Throughput (gal/yr) ÷ Conversion (2,000 lb/ton) × (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only)
[5] Based on 30 days per month.
[6] Maximum monthly breathing loss from TANKS 4.0.9d. Hourly emissions calculated by dividing monthly losses by hours per month× (1 - DRE %) × H_2S Emission Factor (lb H_2S/lb VOC, for H_2S calculation only).
[7] Assumes 10 tanks can be filled in the worst-case hour.
[8] Hourly emissions are based on 10 tanks standing idle in the worst-case hour.
[9] Annual emissions are the maximum of breathing emissions from TANKS 4.0.9d output. Assumes that no tank is full for more than 30 days
Working Losses (tons/year) = Annual Emissions (working losses per tank, tons/year) × Annual Loading (tanks/year)
Breathing Losses (tons/year) = Maximum VOC Breathing Losses (lb/month-tank) ÷ Conversion (2,000 lb/ton) × Annual Loading (tanks/year) × (1 - DRE %)

Conversions:

°R = °F + 459.67
2,000 lb/ton
24 hrs/day

Table 21
Frac Tank Breathing Emissions (EPN MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Month	Crude [1] (lb/mo)	Condensate [1] (lb/mo)
January	393.3034	288.6594
February	425.9941	308.3563
March	567.1329	397.0044
April	625.7493	419.6469
May	714.3594	459.0618
June	822.6998	506.9638
July	1043.3096	621.5208
August	927.0421	559.0998
September	734.5403	460.9244
October	656.5797	438.1532
November	490.8873	345.0498
December	412.5846	299.6723

Notes:
[1] From TANKS 4.0.9d output files.

Table 22
Controlled MSS Emissions (EPN MSS-CONT)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC
REVISED JANUARY 2021

= Updated as part of retroactive PSD analysis associated with January 2021 permitting action

Input	Value	Unit
NOx Emission Factor [1]	0.10	lb/MMBtu
CO Emission Factor [1]	0.07	lb/MMBtu
PM Emission Factor [2]	7.45E-03	lb/MMBtu
DRE	99.9%	%
Heating Value of Crude [3]	19,580	Btu/lb
Heating Value of Condensate [3]	20,007	Btu/lb
Crude H_2S Emission Factor	0.0011	lb H_2S/lb VOC
Condensate H_2S Emission Factor	0.0004	lb H_2S/lb VOC

	VOC (Crude) [4]		VOC (Condensate) [4]		Heat Input (Crude) [5]		Heat Input (Condensate) [5]		H_2S to Control (Crude) [6]		H_2S to Control (Condensate) [6]	
Stream	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term (MMBtu/hr)	Annual (MMBtu/yr)	Short-term (MMBtu/hr)	Annual (MMBtu/yr)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)	Short-term Vapors to Control (lb/hr)	Annual Vapors to Control (tpy)
Equipment MSS Vapors	403.16	8.87	524.10	11.53	7.89	347.33	10.49	461.37	0.44	9.63E-03	0.19	4.28E-03
Equipment MSS Refilling	241.93	5.32	314.50	6.92	4.74	208.42	6.29	276.86	0.26	5.78E-03	0.12	2.57E-03
Air Mover and Vacuum Truck MSS	127.91	5.12	166.29	6.65	2.50	200.36	3.33	266.15	0.14	5.56E-03	0.06	2.47E-03
Frac Tanks	155.67	28.15	202.38	30.35	3.05	1,102.33	4.05	1,214.37	0.17	0.03	0.08	0.01

	VOC [7]		NO_x [8]		CO [8]		$PM/PM_{10}/PM_{2.5}$ [8]		SO_2 [9]		H_2S [10]	
Stream	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)	Maximum Short-term Emissions (lb/hr)	Annual Emissions (tpy)
Equipment MSS Vapors	0.52	0.01	1.05	0.02	0.70	0.02	0.08	1.72E-03	0.82	0.02	4.38E-04	9.63E-06
Equipment MSS Refilling	0.31	6.92E-03	0.63	0.01	0.42	9.26E-03	0.05	1.03E-03	0.49	0.01	2.63E-04	5.78E-06
Air Mover and Vacuum Truck MSS	0.17	6.65E-03	0.33	0.01	0.22	8.90E-03	0.02	9.92E-04	0.26	0.01	1.39E-04	5.56E-06
Frac Tanks	0.20	0.03	0.40	0.06	0.27	0.04	0.03	4.52E-03	0.32	0.06	1.69E-04	3.06E-05
Emissions [11]	**0.52**	**0.06**	**1.05**	**0.11**	**0.70**	**0.07**	**0.08**	**8.27E-03**	**0.82**	**0.10**	**4.38E-04**	**5.15E-05**

Notes:
[1] Emission factors for PORTVC are from TCEQ's RG-109 Flares and Vapor Oxidizers (Oct 2000) guidance document, factors for vapor oxidizers
[2] PM emission factor is from AP-42 Section 1.4, Table 1.4-2, factor for PM (Total). PM factor is for particles < 1 µm in diameter, therefore PM = PM_{10} = $PM_{2.5}$. To convert to lb/MMBtu, the PM factor (7.6 lb/10^6 scf) is divided by the heat content of natural gas (1,020 Btu/scf).
[3] Higher Heating Values from GREET 1.8d.1, Argonne National Laboratory, released August 26, 2010. Heating value of gasoline is used for condensate.
[4] From Tables 18, 19, and 20.
[5] Heat Input (MMBtu/hr) = Short-term Vapors to Control (lb/hr) × Heating Value of Product (Btu/lb) ÷ Conversion (1,000,000 Btu/MMBtu)
Heat Input (MMBtu/yr) = Annual Vapors to Control (tpy) × Heating Value of Product (Btu/lb) ÷ Conversion (1,000,000 Btu/MMBtu) × Conversion (2,000 lb/ton)
[6] H_2S to Control (lb/hr and tpy) = Vapors to Control (lb/hr or tpy) × H_2S Emission Factor (lb H_2S/lb VOC)
[7] VOC (lb/hr and tpy) = Maximum of Crude and Condensate Vapors to Control (lb/hr or tpy) × (1 - DRE %)
[8] NO_x, CO, and $PM/PM_{10}/PM_{2.5}$ (lb/hr and tpy) = Maximum of Crude and Condensate Heat Input (MMBtu/hr or MMBtu/yr) × Emission Factor (lb/MMBtu) [÷ Conversion (2,000 lb/ton) for annual emissions]
[9] SO_2 (lb/hr and tpy) = Maximum of Crude and Condensate H_2S to Control (lb/hr or tpy) ÷ MW H_2S (lb/lb-mole) × 1 lb-mole S/1 lb-mole H_2S × 1 lb-mole SO_2/1 lb-mole S × MW SO_2 (lb/lb-mole)
[10] H_2S (lb/hr and tpy) = Maximum of Crude and Condensate H_2S to Control (lb/hr or tpy) × (1 - DRE %)
[11] Short-term emissions are the maximum of any activity. Annual emissions are the sum of all activities.

Conversions:

1,000,000	Btu/MMBtu
2,000	lb/ton
34.08	MW H_2S, lb/lb-mole
64	MW SO_2, lb/lb-mole

Table 23
Miscellaneous Inherently Low Emitting Maintenance Activities (EPN MSS-ATM)
Moda Ingleside Energy Center
Moda Ingleside Facilities, LLC

Maintenance Activity	Emissions/Event (lbs)	Events/Hr	Events/Year	VOC [1]	
				(lb/hr) [2]	(tons/year) [3]
Minor Facilities (i.e., pumps, valves, piping, filters, compressors, sight glasses, etc.) with isolated volumes < 45 ft^3	10.68	2	40	21.36	0.21
Total Miscellaneous Maintenance Emissions				**21.36**	**0.21**

Notes:
[1] The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency or individual activities.
[2] VOC (lb/hr) = Emissions/event (lbs) × Events/hr
[3] VOC (tons/year) = Emissions/event (lbs) × Events/year ÷ Conversion (2,000 lb/ton)